A NEW GEOGRAPHY

OF

THE INDIAN EMPIRE AND CEYLON

BY

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THIRD EDITION

REVISED AND ENLARGED, WITH NEW MAPS AND DIAGRAMS

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PREFACE TO THIRD EDITION.

ADVANTAGE has been taken of the demand for a new issue of the book to rearrange the matter dealing with the provin of Bengal, Bihar and Orissa, and Assam, rendered neces. by recent changes in the political map, to revise the s tical matter in view of the census returns just publishe in general, to keep the book up to date

MADRAS. 1912

PREFACE TO SECOND EDITION.

THE reception accorded to the first edition of this text-book has been very encouraging. Within a year of its publication re-issues have been repeatedly called for, and it has found its way into every quarter of the Indian educational world. I am sensible that this result has been due as much to the lack of an adequate text-book following modern methods, dealing specifically with the subject of Indian Geography, as to any merits of the book itself. At the same time, the testimony of many teachers from all parts of India who have

[illegible]

cisms, too, which have reached me from many readers, unconnected with the work of education, into whose hands the book has come, are evidence that it has in some measure succeeded in presenting the ordinary facts of India's geographical economy in an interesting way.

It is hoped that, in the present edition, the obvious defects of its predecessor have been remedied. The maps are, I trust, what they are meant to be—a feature of the book. They are almost all new and have been specially prepared to illustrate the text. They have been drawn by Messrs. Bartholomew & Co.'s staff of skilled draughtsmen, just at the time when they had in hand, under the authority of the Secretary of State, the maps and atlas for the new edition of the Imperial Gazetteer of India. Their accuracy and authenticity are thus guaranteed.

As to the text, while the letterpress has been entirely re-set and reprinted, and purged of a few inaccuracies, an endeavour has been made to preserve the book as far as possible in its original shape so as to avoid temporary inconvenience in schools where the old edition may still be used as a lesson-book. The distinction of large and small type as indicative of important and of secondary matter has been more carefully preserved. At the same time, a few new paragraphs have

been introduced where it was thought that the general geographical conditions of India had not been sufficiently emphasised, or where fuller illustration of their effects seemed called for. A chapter has been added on Ceylon. Though not a part of the Indian Empire, the island is, geographically and economically, so closely connected with the mainland that its inclusion in the book seems desirable.

At the present day, complaint is loudly (and not unjustly) made that the education imparted in Indian schools and colleges is of a too literary and academic flavour; that it is widely divorced from the facts and environment of daily life. To such a charge the intelligent teacher of Geography can with confidence plead "Not Guilty." The measure of success he wins is precisely in proportion as he invests the subject with the vividness of present concrete reality. In his hands a study of the Geography of India is not merely a means of conveying useful and interesting information; it gives him a golden opportunity to present to Indian youths a living picture of the land they dwell in and to impart a knowledge of the conditions under which its teeming populations live. To illumine and enforce his teaching there is scarcely any department of knowledge or source of information from which he may not borrow; no issue of a daily paper but contains some illustration of the facts and laws he deals with. Among the present day needs of India there is none greater than that of a widely diffused knowledge of the elemental facts of the country itself. To such knowledge a study of its geographical features and climate is an essential preliminary. For an educated youth in India there can be no better intellectual possession than a grasp of the various natural conditions on which depends the welfare of its different provinces.

A study of these things may, it is hoped, lay the foundations of a balanced and informed judgment without which public spirit and genuine patriotism (the absence of which in India is so generally deplored) can have no real basis. Certainly, to *love* a land one must first *know* it. To set about discussing how Governments rule India without first learning and appreciating how Providence has dealt with her can only lead to futility and confusion.

1909.

C. M.

PREFACE TO FIRST EDITION.

I TRUST the objects aimed at in this little book will be made sufficiently clear by a glance through its pages, but one or two of these objects may be here set down.

In the first place, an attempt has been made to put and keep clearly before the pupil the causes of things. The study of geography, to have any real educational value, must be a mental discipline, a rationalizing process. Hitherto it has largely been a mere r [illegible]
formation concerning [illegible]
subject, if rightly app [illegible]
first doorway to the great world of science; * its province in this respect should be jealously conserved. It may be made the means for giving the young intelligence, eager for knowledge, its first conceptions of how man affects and has been affected by his environment (a not altogether inadequate definition of science as a whole), or it may be made the driest and least suggestive of all studies.

The study of the geography of the Indian Empire is educationally of peculiar value. To give only a few reasons:—Its physical and meteorological phenomena are on a majestic scale, and their influences are direct and clearly marked. The geographical conditions affecting the life of its peoples are likewise simple, and yet broadly defined. Modern factors such as steam and electricity, which have transformed the conditions of life in Western countries, have only begun to affect

* Could not, for example, a very interesting lesson be given, with the aid of a physical map of India, on the simple fact that water flows from a higher to a lower level at a rate proportionate to the slope?

the peoples of India and Burma; their influences can therefore be more clearly seen in operation.

In the second place, it has been sought to introduce some kind of rational sequence into the subject-matter, and especially to throw the whole into intelligible perspective. With this in view, emphasis has been laid on the outstanding physical and climatic features of the Indian Empire, with their consequences. The "political" geography has been relegated to a subordinate place. In this connection I may be allowed to quote a couple of sentences from a paper on geographical teaching by Mr. C. Bird, F.G.S., Headmaster, Rochester Mathematical School, which was brought to my notice after this book had been sent to the press:—

> "With this object in view, a few general principles should be well explained and drilled in at the outset, and continually referred to. The chief of these are the conditions which determine the climate of a country. Very careful explanations should therefore be given of the effect of latitude, elevation, position with reference to the sea, ocean currents, and prevalent winds, and the position and direction of mountain chains. If these are clearly understood, a geographical lesson may be made really educational. By studying the position of a country on the globe and on a good map, its climate may be deduced with very little assistance. This gives the key to its vegetable and animal products, and suggests the occupations of its inhabitants......Besides being influenced by climate and general geographical conditions, the present condition of a country is to a considerable extent the result of its previous history; and history therefore should as much as possible be joined with geography by giving a brief sketch of, at least, its immediately preceding history."

These words adequately express what was in my own mind in sketching the main theme of this book. Further, it is hoped that the somewhat full treatment given to the chief cities and towns—in particular to the causes of their growth—may throw into useful relief their relative importance. One of my aims has been to place each of the large towns into some sort of historical and geographical setting, and to get rid, as far as possible, of that pernicious schoolboy habit of associating the name of a town simply with a black dot on a map, and with some apparently quite arbitrary facts in the text which state for what the place is "famous."

In any case, the very last purpose which this book seeks to serve is that of a gazetteer or post-office guide. One of its

merits, it is hoped, is that it has managed to omit and ignore [illegible]

As an aid towards giving the book "perspective," the less important portions have been put in smaller type. Some of the small type sections might, indeed, with some advantages, have been omitted altogether. They deal, for the most part, with matters which ought to be, and can far more effectively be, learned by the eye from the map; and in my view what the eye can learn for itself should be, as far as possible, excluded from the text. The pupil should learn his Whats and his Wheres from the map, especially his physical map, and his Whys and Wherefores from his book. I have throughout had no scruples in constantly repeating in one place what has already been said in another; and I would rather, in any judgment to be passed on the picture of the Indian Empire here presented, be accused of leaning to the side of caricature than of adhering too closely to the minutiæ of photographic detail.

Lastly, the object of these pages is to give an adequate conception, if possible, of the Indian Empire as a going concern—as a place where nearly three hundred millions of human beings earn their livelihood. From this point of view the book must be condemned or vindicated.

In English and Scottish schools the complaint is constantly made that the subject of geography is tossed into an odd corner of the daily or weekly curriculum, and assigned to any teacher, whether acquainted with the subject or not, who is otherwise disengaged for the time being. And so long as a string of Whats and Wheres in an examination paper is all that is to be prepared for, perhaps this arrangement is the best adapted to the purpose in view. In India a similar complaint that "cram," as opposed to real education, is the *modus operandi* of most school work, has been officially recognized. In my humble opinion a great deal can be effected—I speak of the subject of geography in particular—by prescribing definite and detailed syllabuses for the study of the subject, and by seeing that the examinations are real educational tests, not memory puzzles. How much easier it is to set (and correct) a paper testing a pupil's memory of facts than one which tests his power of thinking!

Of course no book on geography, or on any other school sub-

ject, can be of much use without efficient teachers to expound and bring it home to the pupils, and no teaching can be ultimately of much value which keeps its eyes fixed exclusively on likely questions in a prospective examination paper. In England, in quite recent years, a movement among teachers for improvement in the methods of teaching the subject of geography has gained recognition, and the advance made in this direction is practically a revolution. It will take some time for this revolution to spread to India. I should feel flattered if this book proved, in some measure, the forerunner of what is to come.

Of the deficiencies of this book no one can be more conscious than myself. Some of them are incidental to a book which has to be kept within manageable limits, and which is confessedly the result of a compromise between the old methods and the new. I have been advised, for example, boldly to strike out much of the detailed regional topography. To do so would leave room for much more interesting matter, but it would be to overlook the present requirements of a text-book intended for the use of schools in India and Burma.

One word more: along with this book *a good atlas*, containing both physical and political maps, *should be in constant use.* Without an atlas, it is hopeless to attempt to grasp the physical features of a country, or to follow topographical detail. Mere memory work in these respects is of small geographical value; an intelligent appreciation of geographical facts can be attained only by continual study of, and reference to, the map.

CAMERON MORRISON.

NEWINGTON, MADRAS, 1906.

LIST OF MAPS.

THE INDIAN EMPIRE.

INTRODUCTION.

By the Indian Empire we mean the whole area of Southern Asia over which the dominion of Great Britain extends.

Geographically, this Empire extends over India proper and Burma, and a few islands off their coasts.

India proper consists of all the lands lying between the Himalayas with their eastern and western offshoots, on the one side, and the Indian Ocean on the other. It is not a single country, but a collection of countries which differ in physical features, soil, climate, productions, and in the races, languages, and religions of the people who inhabit them. The southern half of India consists of a peninsula jutting out into the Indian Ocean.

Burma lies to the east of India proper, from which it is separated by an arm of the Indian Ocean called the Bay of Bengal. It forms part of the Indo-Chinese Peninsula.

HOW TO DRAW THE OUTLINE OF INDIA AND BURMA.

The best way to understand the geography of a country is to learn to draw the outline accurately and neatly. This should be learned from a good map; but it is much easier to draw and to remember the outline, if we have some kind of frame to fit it into. *[See map 2.]*

1 Take a sheet of paper, rectangular in shape, and place it before [illegible] ...e left-hand edge [illegible] ...d bottom edges, draw a straight line AC perpen... [illegible] and neatly joining them



... ASIA, SHOWING THE POSITION OF THE INDIAN EMPIRE.

3. [illegible]

4. [illegible] erpendicular to AC, making IX ec[illegible]

5. [illegible] a semicircle to the north of IY [illegible]

[illegible]

making AM equal to AC.

7. Produce XI to meet KC at P. Half-way between I and P mark a point G [illegible] wo straight [illegible] This figure [illegible] Join SM [illegible] mir, K for Karachi, C for Cape Comorin, X for Chittagong, M for Moulmein, S for the northernmost point of Burma, where the Salween enters Burma, I stands for Indore, P for the end of the Kathiawar Peninsula, and G for the head of the Gulf of Cambay.

On the line XI Calcutta stands about the same distance west from Chittagong as P is west from G.

The figure gives us all the boundaries :—

1. **Landward.**—(1.) North-west boundary; guiding line **AK.** (2.) North boundary; guiding line **AS.** (3.) East boundary of [illegible] ie **KC** (2.) East coast; guiding line **XM.**

The line **XS** gives a rough guide to the frontier between India and Burma.

1. **North-west Boundary; guiding line AK.**—The guiding line **AK** gives us the general line of the Indus, and the valley of the Indus is the natural boundary of India proper. But by treaties with the Amir of Afghanistan and the Khan of Kalat, the British Government has arranged that the boundary shall lie well west of this valley, and the Indian Empire includes the North-west Frontier Province (with Chitral), and Baluchistan, which are all west of the Indus. The outer boundaries of these provinces, where they touch Afghanistan, must be studied from the map.

2. **The Northern Boundary; guiding line AS.**—India is bounded all along the north by the Himalayan Mountain ranges, but the actual frontier line lies sometimes to the north and sometimes to the south of the great peaks. If we draw a downward curve from **A** to **S** we get the general line of the Himalayas, but the boundary line of India only roughly follows this curve. (1.) Starting from our point **A**, the boundary goes for 350 miles in the direction of **S**, but then turns sharply at right angles nearly south for another 350 miles (crossing the Indus and Sutlej), thus forming, as it were, a great step of a stair (2.) It then forms another step of the same shape, but of half the size.

2. SKELETON MAP OF THE INDIAN EMPIRE.

along the Gharwal Range of the Himalayas and down the Kali or Sarda River (a tributary of the Gogra). This second step of the stair is important, as it marks the part of the boundary of India which lies in the United Provinces. (3.) From the point where the Kali reaches the plains, the boundary stretches along the southern face of the Himalayas up to **S**, with only one break where it forms a "loop" between Nepal and Bhutan, touching Kinchinjunga, and enclosing the upper valley of the Tista, which forms the protected state of Sikkim.

3 **Eastern Boundary of Burma; guiding line SM.**—The guiding line is roughly the line of the Salween, which enters the Gulf of Martaban at Moulmein (1.) If we draw a figure *S* across this line, starting a little south of **S** and ending a little north of **M**, we get the northern half of the eastern boundary of Burma. (2) If from the point where this *S* strikes the Salween above Moulmein, we draw a line down the middle of the Malay Peninsula and end it off at Cape Victoria, we have the complete eastern boundary of Burma. The lower curve of this figure *S* just touches the Mekong River, which is the most easterly point of the Indian Empire.

4. **The West Coast; guiding line KPC.**—The secret of drawing this coast correctly is to fix a point on the guiding line two-thirds of the distance between **P** and **C**. This is Mangalore, and here the coast cuts the guiding line. (1.) The coast-line from **G** bulges gradually westwards till it cuts the guiding line at Mangalore, and, south of it, it keeps a little west of the guiding line till they meet again at Cape Comorin. (2.) A semicircle dipping south connecting **P** with **G** gives the north coast of the Gulf of Cambay. (3) The outline of the Rann and Gulf of Cutch, both of which lie east of the guiding line, must be remembered by the eye. (4) Having got Mangalore on the west coast, we can mark in Madras, opposite to it, on the east coast, and Bangalore half-way between them

5. **The East Coast; guiding line CX.**—This coast runs roughly along the guiding line to Point Calimere, after which it leaves it, runs due north past Madras, and does not touch it again till it reaches **X** The shape of the figure made by the guiding line and the coast should be carefully studied and remembered by the eye. (1.) Note that the part of the coast between the mouths of the Kistna and Mahanadi runs nearly parallel to the guiding line. (2.) The coast of India opposite Ceylon is rather like a man's face with a Roman nose (Point Calimere) and a protruding lower lip (Rameswaram Island)

6. **The West Coast of Burma; guiding line XM.**—This coast is [illegible] the lower (the [illegible] upper part is [illegible] are joined by

Cape Victoria, the southernmost point of Burma, is nearly opposite Point Calimere, and the delta of the Irrawaddy is nearly opposite that of the Godavari.

Note.—The diagram also enables us to calculate roughly the **area** of the Indian Empire. The three triangles ACX, ACK, and SXM are together practically equal in area to the whole Indian Empire, for the parts of the Empire outside them roughly balance those sea and land portions inside them which are not part of the Empire.

The line AC may be taken = 2000 miles. Hence IX = 1000 miles: hence area of triangle ACX $= \frac{AC \times IX}{2} = \frac{2000}{2} \times$ 1000 = ... 1,000,000 sq. miles

The areas of triangles AKC and XSM are together about $\frac{3}{4}$ of triangle ACX, *i.e.* 750,000 ,, ,,

Total . . . 1,750,000 sq. miles

Thus the total area of the Indian Empire may be remembered as $1\frac{3}{4}$ million square miles: it is really a *little* more than this.

THE RELIEF OF INDIA.

India proper may be divided into four regions :—

1. *Region of mountains.*
2. Region of plains
3. Region of table-lands.
4. Coast-strips.

REGION OF MOUNTAINS.

India is separated from the rest of Asia by mountain ranges which can be divided thus :—(1.) Himalayas; (2.) Trans-Himalayas; (3.) Western offshoots; (4.) Eastern offshoots. [*See maps 4 and 5*]

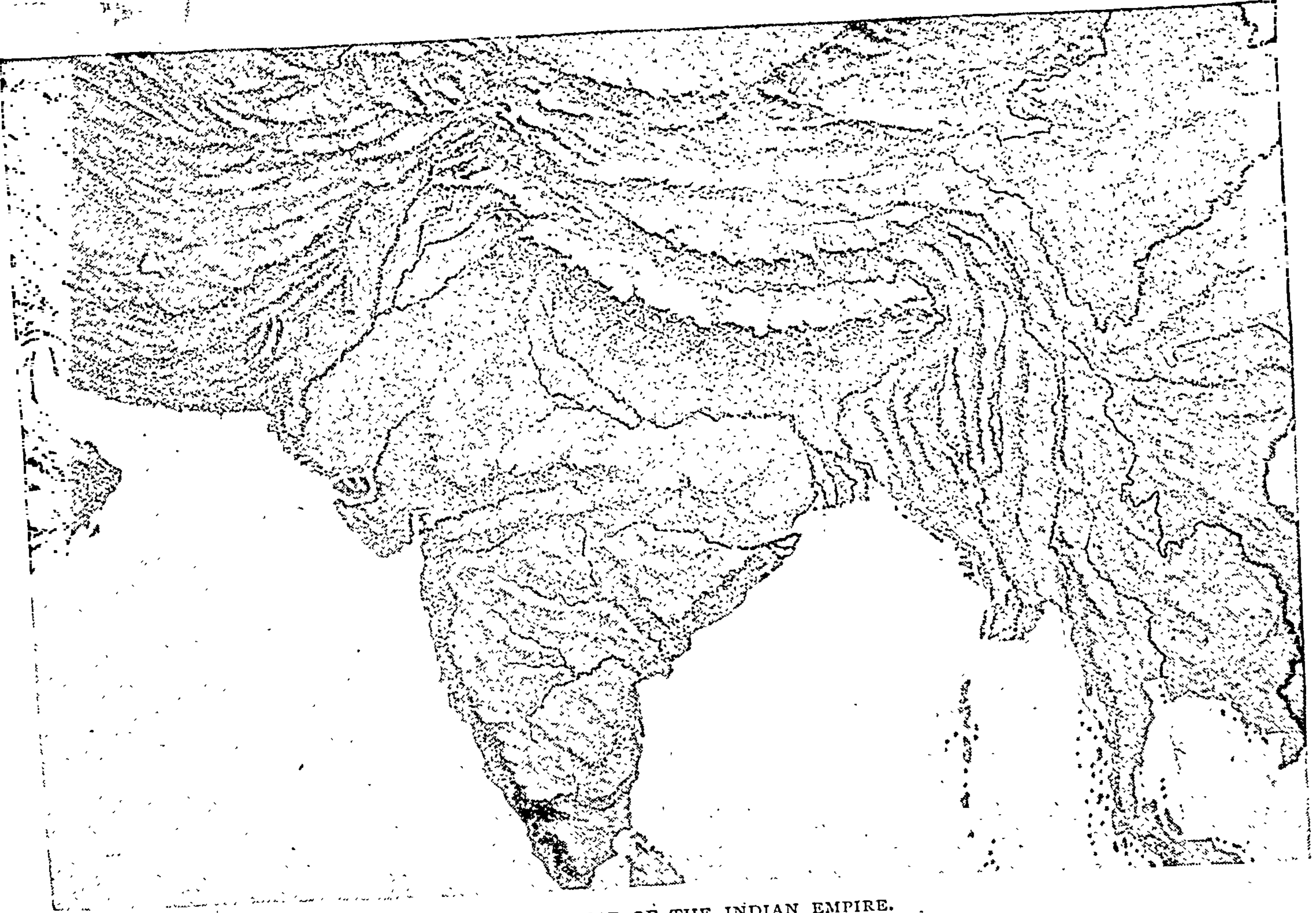
1. **Himalayas.**—The Himalayas are made up of three roughly parallel ranges.

(1.) **The inner range,** sometimes called the Zaskar Range, begins at the peak of Nanga Parbat, and runs in a great sword-like curve to the north-east corner of Assam. It lies in the embrace of two rivers, the Indus turning sharply round its western, and the Brahmaputra round its eastern end.

(2.) **The main or outer range** runs south of, and roughly parallel to, the inner range. At their western end these two ranges open out and enclose the beautiful valley of Kashmir with its Wular Lake. The outer range is here called the *Pir Panjal.*

(3.) **The outermost or sub-Himalayan range** is not high, and it is in some places separated from the outer range by wide valleys. The *Salt Range* and the *Siwaliks* are separate parts of this range in its western half; in its eastern half it is more distinctly marked, running along the *southern boundary of Nepal and Bhutan.*

The Himalayas, with an average height of 19,000 feet, are *the loftiest mountain range* in the world, and they contain the highest measured peak, Mount Everest (29,002 feet). Count-



2. RELIEF MAP OF THE INDIAN EMPIRE.

from west to east, the following are some of the best own mountains: Nanga Parbat (26,000 feet), Nanda Devi 5,000 feet), Dhaulagiri (26,000 feet), Gosainthan (26,000 et), Mount Everest, Kinchinjunga (28,000 feet), Chumalhari 4,000 feet). These Himalayan ranges form a great *double arrier* between India and Tibet 1,500 miles long, and from 50 to 250 miles broad. On the southern slopes of this barrier there are magnificent forests, steep gorges, and hot valleys; in the middle of it is a great expanse of lofty mountain peaks covered with eternal snow and ice; and on the north there are elevated valleys with but little vegetation.

The Himalayas are not a true water-parting, for many large rivers—*e.g.* the Indus, Sutlej, and Brahmaputra—cut through them from the table-land of Tibet to the plains of India. In this way the Himalayas form a *great reservoir of moisture* for the plains of India. All the rain that falls on the Himalayas, whether on their northern or southern slopes, is carried by rivers into India.

2. Trans-Himalayan Ranges.—Our point A is a convenient one for fixing these. It is like the top of an open umbrella, from which the mountains curve downward like ribs on either side.

On the West.—(1.) The great **Hindu-Kush Range**, striking south-west into Afghanistan.

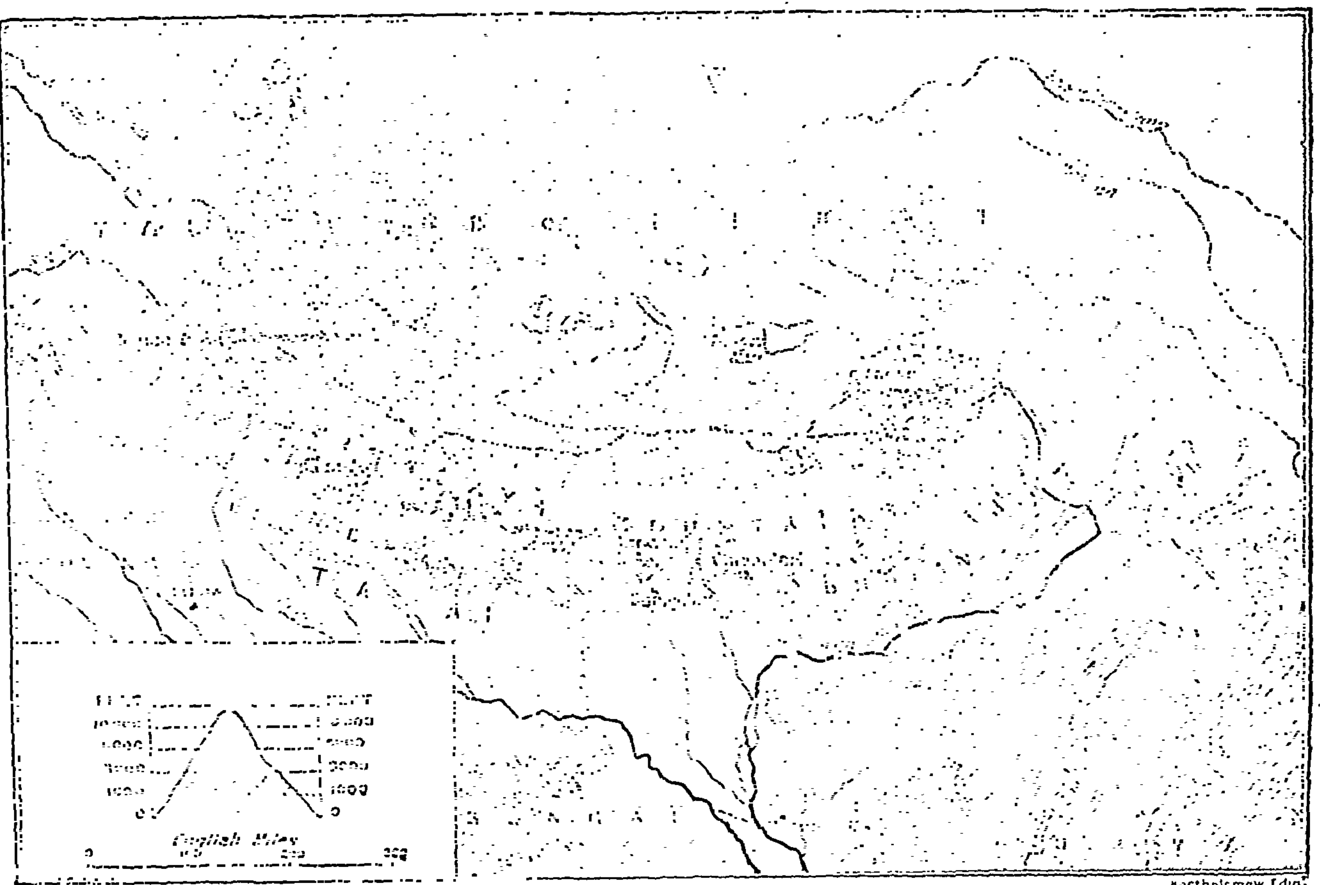
(2.) **Three minor ranges** running nearly south from the Hindu-Kush, and separating the valleys of the Kunar, Panjkora, Swat, and Indus rivers. [*See* p. 181.]

On the East.—(1.) The **eastern half of the Hindu-Kush** and the great **Kwen Lun Range**, forming the northern limits of Kashmir, and striking due east outside of India altogether.

(2.) The great **Karakoram** or **Mustagh Range**, sloping more southwards.

(3.) The **Kailas** or **Gangri Mountains**, running south-east across the middle of Kashmir, and keeping north of the Indus.

Passes of the Himalayas.—There are several passes acros these mountains from India into Tibet. But we mu remember (1.) that they are only useful for trade purpose no army could ever venture through them into Indi (2.) they are only passable during certain months when snow has melted; (3.) even as trade routes they at pres



4. MOUNTAIN REGION—EASTERN HALF.

add very little to the foreign trade of India. If we notice on the map the position of four hill stations, **Leh, Simla, Naini Tal**, and **Darjeeling**, we shall get the key to these passes. From Leh a famous route leads across the **Karakoram Pass**; from Simla another route leads through the **Shipki Pass** up the Sutlej gorges; from Naini Tal another similar road enters Tibet; [illegible]
runs through the Chumbi [illegible]
haps, the Brahmaputra a [illegible]
highway between India and Tibet: at present this route cannot be used owing to the opposition of the wild tribes that dwell round it

The Tarai.—Along the southern slopes of the outer Himalayas there is a broad belt of jungle grass and forest called the Tarai. Here is the home of wild animals, such as the tiger, elephant, rhinoceros, and buffalo. This belt, especially in certain seasons, is most feverish and unhealthy.

3. **Western Offshoots.**—On the north the Himalayas and Trans-Himalayas form the edge of the great table-land of Tibet; on the west they send offshoots southwards, separating India from the great Iranian table-land (Afghanistan, Baluchistan, and Persia). These offshoots are:—

(1.) **Three spurs of the Hindu-Kush** (already mentioned), running down to the valley of the Kabul River.

(2.) **The Safed-Koh Range**, lying south of the Kabul River.

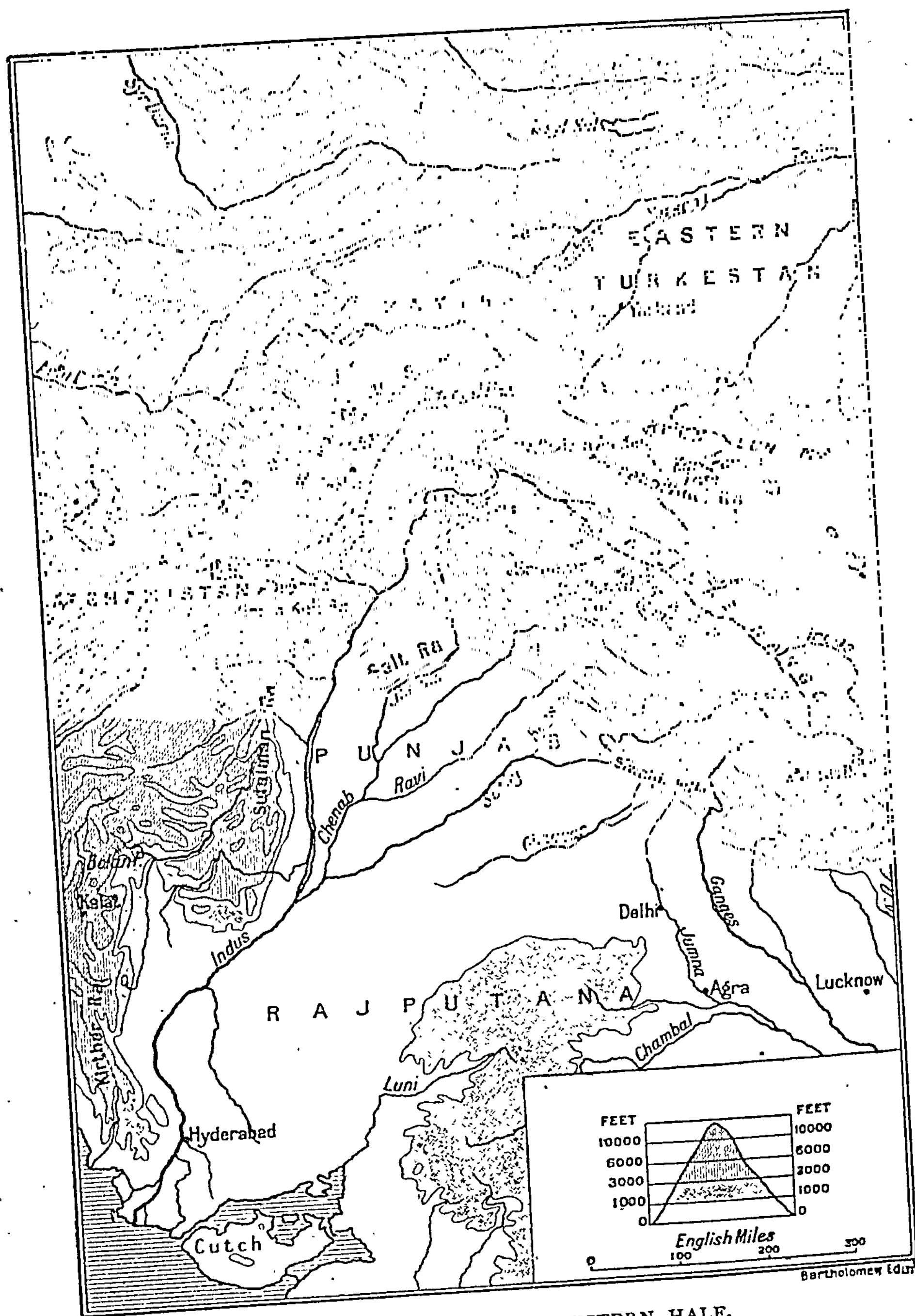
(3.) **The Sulaiman Ranges**, running nearly north and south, with a central peak, Takht-i-Sulaiman (Solomon's throne).

(4.) **The Khirthar Mountains**, stretching in parallel ranges almost down to the sea near Cape Monze.

Naturally, India lies only "as far as the grass will grow" to the east of these offshoots, but for the sake of protection the Government of India has arranged that it shall go beyond the edge and guard the gateways or passes.

Contrast between Tibetan and Iranian Table-land.—The upland country on the west of India differs from the great table-land to the north:—

(1.) **In height.**—The Tibetan table-land varies from 12,000 to 15,000 feet above sea-level, edged on the south by the great Himalayan ranges. The Iranian table-land is only on an average 3,500 feet high, and its edge is formed by comparatively low mountains.



5. MOUNTAIN REGION—WESTERN HALF.

(2.) As a barrier.—The Himalayas are practically impassable for an enemy, but the western offshoots are pierced by many passes, through which at least five great invasions have come into India.

4. Eastern Offshoots. [*See map* 3.]—The Himalayas at their eastmost point (S) seem to be suddenly folded round and to turn south in parallel ranges. These ranges become twisted out of their parallel formation farther south, but form a continuous chain of rugged hills and table-lands stretching from S to M, and then narrowing into a single range running right down the whole length of the Malay Peninsula. This long range is out of India proper altogether, and we leave it at present till we come to consider Burma.

Starting again from S, another mass of mountains runs south-westwards towards X (Chittagong), and then narrows into a long range which gets nearer and nearer the coast till it ends in Cape Negrais. The upper half of this mass divides India proper (Assam) from Burma. It has different names at different places. After leaving S the range is known as the **Patkai** and **Naga Hills**, and farther south as the **Lushai Hills**. Inland from Chittagong is the **Blue Mountain peak**, where eastern Bengal, Assam, and Burma meet. South of this the long range to Cape Negrais is called the **Arakan Yoma**, but it is in Burma. [*See map* 48.] Half-way between S and X the Patkai Range gives off spurs to the west—namely, the **Jaintia Khasi**, and **Garo Hills**, forming the southern and hilly part of Assam

REGION OF PLAINS.

This is the great Indo-Gangetic plain, or simply "the Plains," which lies at the foot of the Himalayas and their western and eastern offshoots. It includes the valleys of the Indus and its tributaries, of the Ganges and its tributaries, and of the Brahmaputra. At its western end it rests on the Arabian Sea in the Indus delta, and at its eastern end on the Bay of Bengal in the Ganges delta. [*See map* 6]

Boundaries: *Outside edge.*—W. The line of the Khirthars and Sulaimans up to the Salt Range where the Indus enters the plains N. The great curve of the Sub-Himalayas from the Salt Range right up the Assam valley to where the

AFGHANISTAN
Kabul
Quetta
Kalat
Suleiman Ra.
Indus
Sutlej
Delhi
Agra
Jumna
Ganges
Lucknow
Gogra
Cawnpore
Allahabad
Benares
Patna
Son
Rajmahal Hills
Ganges
Dacca
Barak
Lushai Hills
Garo Hills
Brahmaputra
CALCUTTA
Sundarbans
Mouths of the Ganges
Hyderabad
Cutch
Vindhya Ra.
Mahanadi
Dhaulagiri
Mt. Everest
Kinchinjunga
Lhasa
T I B E T
M O U N T A I N S
English Miles
Bartholomew, Edinr

6 THE PLAINS OF INDIA

Brahmaputra bends into the plains. **E.** The outer or western edge of the Garo and Lushai Hills.

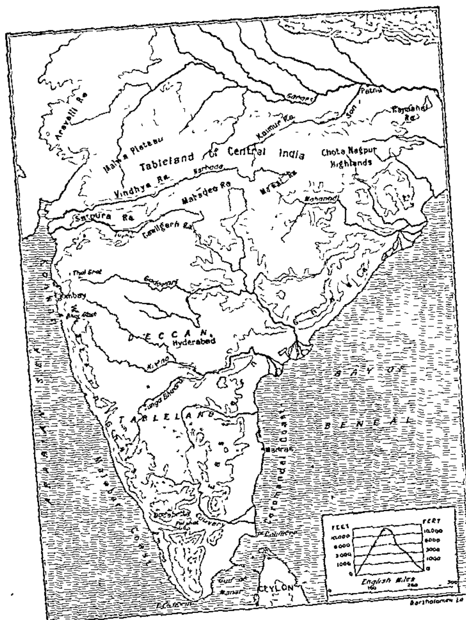
Inside edge.—**W.** A line drawn from the Rann of Cutch to the north end of the Aravalli Hills. **S.** Thence, in a sweep, just south of the Jumna and Ganges, to the bend of the Ganges at the Rajmahal Hills. **E.** Thence to the western end of the Ganges delta.

Cause and Character.—The whole of this plain region is **alluvial**—that is, its soil consists of fine mud and sand washed down by the three great rivers and their tributaries, and spread on the low-lying land. Hence it is very **fertile**, and a great part of the soil is renewed every year by floods. The mud brought down from the hills has been rubbed so fine that "it is possible to go from the Bay of Bengal up the Ganges, through the Punjab, and down the Indus to the sea, over a distance of 2,000 miles and more, without finding a pebble, however small."

This soil is also very **deep.** In the Ganges delta near Calcutta engineers have bored down through layers of mud, sand, and clay for nearly 500 feet without coming to rock. At Lucknow they have dug down 1,000 feet with the same result.

This region is also very **flat.** It is possible to travel along the middle of this vast plain from the Ganges delta to that of the Indus without once seeing the smallest hill or ever rising 700 feet above sea-level. Agra, half-way between the two deltas, and 1,300 miles by river from the sea, is *only* 550 feet above its level. This flatness makes the rivers flow slowly, thus fertilising the country thoroughly, and affording easy waterways and irrigation channels. But though the soil throughout the Indo-Gangetic valley is alluvial and fertile, the western part of it in the Indus valley gets very little rain, and is therefore very little cultivated.

equal in size to France,
put together. It con-
d of India proper, and
nearly two-thirds of the population.



7. THE TABLE-LAND REGION

by two passes—the **Thal Ghat** (under 2,000 feet), a little to the north-east of Bombay; and the **Bhor Ghat** (over 2,000 feet), a little to the south-east of the same city. Just south of the apex of the triangle at the Nilgiri Hills there is a curious opening across the Western Ghats, 20 miles wide and only 1,000 feet high, called the **Palghat Gap.** Through these passes in modern times railways have been built to connect the sea-coast with the rest of India. The east side of the table-land being much lower than the west, and the Eastern Ghats being more broken up than the Western, there are several easy passages from this side into the interior.

2. **The Table-land of Central India** lies to the north of the Deccan, and is, roughly, shaped like a long triangle.

Boundaries.—W. The Aravalli Hills, stretching north-east across Rajputana, and the Mahi Hills, which join the south end of the Aravallis (Mount Abu, 5,650 feet) with the western end of the Vindhyas. **S.** The line of the Vindhyas and Kaimurs. **N.** Not bounded by any range, but sloping gently down to the Jumna and Ganges valley. The south-west corner of this table-land, between the Aravallis and Vindhyas, is called the Malwa plateau. [*See map 7.*]

The Region of Plains and the Region of Table-lands contrasted.—This region is quite unlike the low-lying Indo-Gangetic Plain. It is not smooth and flat but a table-land raised from 1,000 to 3,000 feet above sea-level and broken up into many river valleys which run seawards among ranges of hills. The map shows these ranges, set in different directions, almost all over it.

Again, the drainage of the Plain Region all flows to two points—the delta of the Indus in the west and the delta of the Ganges in the east. But in the Region of Table-lands, owing to the numerous hill ranges, the rivers flow in many directions, and enter the sea at points widely separated from each other.

Again, as we shall see, in the Plain Region the rivers are all-important as waterways, and all the chief towns are built on the large rivers or their tributaries. In the Table-land Region the rivers are not nearly so important, and scarcely a single town of any size is built on a large river.

There is another difference not shown by the map but

which we could almost guess by looking at it—the Table-land Region is not alluvial. It is built up of hard rocks covered with thin soil, except where the rivers have cut channels for themselves and washed down mud along their banks, or where beds of black cotton soil are found.

On the whole, therefore, though the Table-land Region of India is, as the map shows, larger than the Region of Plains, it is not so fertile, and therefore not so thickly populated.

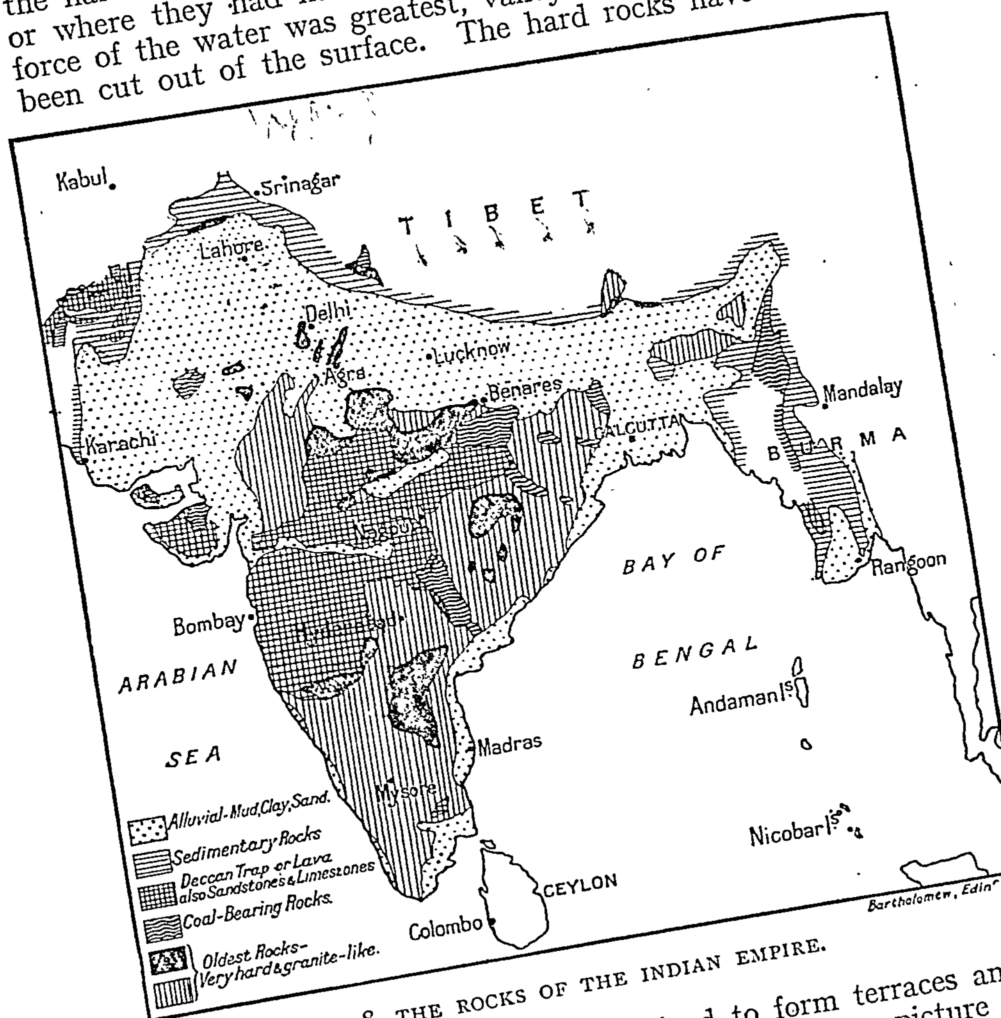
COAST-STRIPS.

West.—From the head of the Gulf of Cambay, right down the west coast to Cape Comorin, there is a strip of country lying between the hills and the seashore. It is divided into two parts—the **Konkan**, or northern, and the **Malabar Coast**, or southern half. Its average width is only about 40 miles.

East.—From the delta of the Ganges to Cape Comorin there is a similar strip lying between the Eastern Ghats and the Bay of Bengal. It is much broader than that on the west coast, especially in the south, where the Eastern Ghats slope away from the coast across the peninsula. This broader part is called the **Carnatic**, and the whole coast is the **Coromandel Coast**. The western coast-strip has no large rivers flowing through it, but the eastern is made rich by the fertile deltas of the **Mahanadi**, **Godavari**, **Kistna**, and **Kavari** (or Cauvery). The soil of the coast-strips is, like that of the plains, alluvial.

How these Regions were formed.—It will help us to understand these different regions if we learn something of how they were formed. Geologists tell us that long millions and millions of years ago the only part of now-existing India was the Peninsula. This peninsula is thus one of the very oldest parts of the earth's surface. After this part of the land had been worn down by rain and rivers for long ages a great change took place. From the bowels of the earth a stupendous outburst of molten rock or lava and ashes was poured over the Peninsula: its old river valleys were filled, and the face of the country was levelled up into **table-lands.** By looking at the broken edge of this rock-covering on the Western Ghats we can see that it was at least 4,000 feet thick. Once more the rain and rivers resumed their work, and they have gradually changed the surface of the country. The

soft rocks have of course been more rapidly worn down than the hard ones. Where these rocks happened to be softest, or where they had natural cracks in them, and where the force of the water was greatest, valleys and river-beds have been cut out of the surface. The hard rocks have resisted



8. THE ROCKS OF THE INDIAN EMPIRE.

the rubbing down and have remained to form terraces an flat-topped hills and mountains. If, then, we can picture our minds this overflowing and solidifying of molten ro and the after action on it through long ages of running wa and rivers, we can understand how the **Deccan** has come be, on the whole, **a huge table-land** cut into water-w

alleys with hills carved out of hard rock. These rocks lie
at, which shows that they have not, like those of other
mountains, been tilted up by forces from beneath.

The **Eastern and Western Coast-strips** have been formed by the wearing down of the edges of this table-land into narrow alluvial coast plains. The edges of these coasts have at the same time slowly sunk or been dipped beneath the sea.*

In these far distant ages our **Region of Mountains,** *i.e.* **the Himalayas and their off-shoots,** did not exist. In their place, and where Tibet now is, was a vast shallow sea at the bottom of which sand and lime were being deposited. Here too a tremendous change took place. There was a movement of the earth compared with which the greatest earthquake man has experienced would be as nothing. The bottom of this sea was heaved up: the sea itself was driven back on all sides and the beds of sandstone and limestone on its floor were raised or arched upwards to form the Tibetan table-land and the mighty Himalayas. At the same time molten granite from beneath was forced up among and through these rocks to form the cores and peaks of the great ranges. Thus the Himalayas are quite different from the Deccan table-land region. They have been raised up by forces from beneath, not carved out by water on the surface: their rocks are tilted, bent, and crushed, not flat like those of the Deccan.

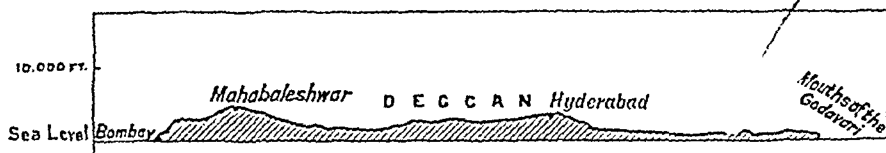
As part of the movement that upheaved the Himalayas, the land between these new mountains and the old peninsula sank downwards, forming a great trough or depression. Into this depression for thousands of years the rivers have run, bringing with them the sand and mud rubbed off the Himalayas, so that on the floor of the Indo-Gangetic valley—the **Region of Plains**—there is now a deposit of mud, clay, and sand, hundreds of feet thick.

There is no evidence to show that the sea ever flowed in the central Plain Region, but the finding of sea-shells among the limestones of the Himalayan rocks—even 20,000 feet above sea-level—proves that these rocks must once have formed a ocean-floor.

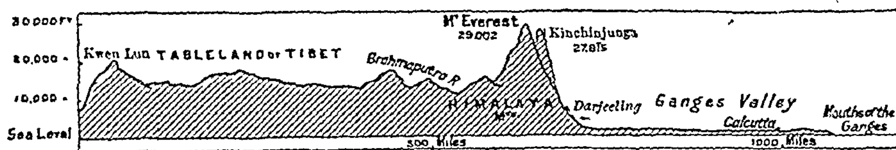
* Thus along the eastern coast-strip engineers, while boring for we have, in several places, come to old sea-beaches. Near Madras beds [illegible]lls have been found nearly 100 feet below the surface.

General Relief.— We can obtain a good idea of the relief of the land of India if we suppose the whole of it were sunk some 900 feet below its present level. What would be the result? Our region of plains and our coast-strips would disappear below the water. Our region of mountains would remain unchanged, but they would be washed by a great sea, separating them from the present region of table-lands, with a small estuary into which the Indus would flow in the north-west corner, and a broader and longer one (the Assam valley) receiving the Brahmaputra in the north-east corner. The table-land region would become a triangular island, with the Vindhyas and Western and Eastern Ghats for its coasts, and with one peninsula (the southern end of the Western Ghats) pointing south and another (the Aravalli Hills) pointing north. The east coasts of this island would be indented with gulfs representing the lower valleys of the present Deccan rivers.

From the sections here given we obtain an idea of the relief of India in another way. It is to be remembered that the vertical heights are on quite a different scale to the horizontal distances. Mt. Everest is only $5\frac{1}{2}$ miles high,



SECTION ACROSS THE MIDDLE OF THE DECCAN.



SECTION ACROSS THE TABLE-LAND OF TIBET THE HIMALAYAS AND THE PLAINS.

COASTS AND ISLANDS OF INDIA.

Coasts of India.—A glance at the map will show two great differences between the seacoast of India and that of almost every other country—namely, (*a*) it is broken by very few inlets of the sea; (*b*) it has very few islands round it. The sea round the coast of India is very shallow, and the shores are usually flat and sandy. These two facts make the few inlets and straits that exist of little importance. These inlets and straits are: (1.) the **Rann of Cutch** (divided into the Great Rann and the Little or Eastern Rann); (2.) the **Gulf of Cutch**; (3.) the **Gulf of Cambay**; (4.) the **Backwaters** of Cochin and Malabar, all on the west coast; (5.) the **Palk Strait** and the **Gulf of Manaar**, between India and Ceylon; (6.) the **Pulicat, Kolar,** and **Chilka Lakes,** on the east coast; (7.) the **inlets of the mouths of the Ganges** Judging by their size on the map these look important, but they are really not so. None of them is of any use for the navigation of large vessels.

The two **Ranns of Cutch** have altogether an area of 9,000 square miles, but they are very shallow and little more than swamps in the rainy season when the summer monsoon blows the waves of the Arabian Sea into the Gulf of Cutch. In the hot season they are dry, barren stretches of salt sand, the haunt of wild asses

The **Gulf of Cutch** is little better. Only in certain seasons is it connected with the Ranns.

The **Backwaters of Cochin and Malabar** are lagoons connected together and joining some small rivers on the coasts, with outlets to the sea. They are important waterways as far as they go, but they are only fit for small boats, canoes, and rafts.

In the days, however, before European commerce was established, Arab traders resorted in great numbers to the small natural harbours formed by gaps in the lagoon breakwater, and at that epoch Quilon, Alleppey, and Cochin were great trading-centres, whence a considerable

commerce was carried on by sea with the ports of Arabia and the Persian Gulf.

The **Gulf of Manaar** and **Palk Strait** (which is nearly blocked by the Rameswaram Island, the rocky reef called Adam's Bridge, and the island of Manaar) are also very shallow, and are useless for big steamers, which have in consequence to go round by the south of Ceylon.

The **Pulicat, Kolar,** and **Chilka Lakes** are scarcely worth notice. They are all shallow inland lakes of brackish water, of no great size, connected with the sea by channels which are easily choked up with sand and silt except in the rainy season.

The inlets forming the **mouths of the Ganges** also look more important than they are. For miles to seaward of them the water is very shallow, and only in flood time are they of much use for navigation by small boats. The Hooghly is, however, kept deep enough for large vessels.

Islands of India.—The chief islands connected with India are:—(1.) The island of **Ceylon**, which is not connected politically with India. (2.) The **Laccadive and Maldive Islands**, lying to seaward, the former off the Malabar coast, and the latter off the west coast of Ceylon. These are groups of islands formed by the coral polyp, or "insect," from the lime in the sea-water. They are very flat, scarcely rising 20 feet above sea-level; very barren, except for the growth of cocoa-nut trees, which thrive well; and some of them are mere sand-banks or bare rocks. The Maldive Islands are joined to Ceylon for purposes of administration. (3.) The islands of **Rameswaram and Manaar**, between India and Ceylon; not important except that the former is a famous place of Hindu pilgrimage.* (4.) At the mouth of the Ganges are one or two flat, swampy islands, really parts of the delta. **Sagar and Diamond Islands** are the chief. (5.) The islands of **Bombay** and **Salsette**, which, with some others, form Bombay harbour. These are small but important, as they protect its shipping from the storms and monsoon of the Arabian Sea.

* A railway bridge is being built to join Rameswaram Island with the mainland.

CLIMATE AND RAINFALL OF INDIA.

Climate.—We must carefully distinguish *climate* from *weather*. The climate of a place may be very dry though the weather there at a particular time may be wet, just as a healthy man may be suffering from fever on a particular day. In other words, while weather means the state of the atmosphere at a single period of time, say a day or a week, the climate of that place is the total of the weather usually and regularly met with at each season at that place. Therefore, in describing the climate of a place, we need take account only of those weather conditions which are most regularly and commonly met with. These weather conditions are heat and cold, dampness and dryness, rain, direction and nature of winds, &c., and they chiefly depend on five things: (1.) *latitude*; (2.) *altitude*; (3) *nearness to sea*; (4.) *direction of mountain ranges*; (5.) *nature of the soil*. India is so large, and the five conditions here given vary so much in different places, that we cannot speak of India having *a* climate. It has different climates in different places, and the climate of each of these places changes in different parts of the year. This is the case with every large tract of land in the world, but it is more true of India than of any other. We must now examine how these five things influence the general weather conditions that make up climate.

1. **Latitude, or Distance from the Equator.**—The south of India, including the whole of the peninsula, is in the Tropics, and the northern half in the Temperate Zone. Hence India, as a whole, is an excessively hot country, and, on the whole, the heat gets less as we go north. Thus Trichinopoly, in the south of the peninsula, has an average temperature for the year of 82° F.;* Bombay, half way up, a temperature of 80°; and Karachi, in the north, one of 77°. The Tropic of Cancer, separating the Torrid from the Tem-

* By the temperature of a place we always mean the temperature in the shade.

perate Zone, passes across India about 70 miles north of Calcutta and the head of the Gulf of Cambay.

But mere distance from the equator is not everything. Owing to the motion of the earth, the sun strikes the northern hemisphere more directly during one part of the year than during another. In May and June the sun at midday is getting directly overhead at places nearer and nearer the Tropic of Cancer, till on June 22 he is directly overhead at places on that line. This means that in the peninsula, and at places a little north of the line, it is very hot during May and June. But, again, during those months the sun is longer above the horizon the farther we go north. Hence, in places just north of the tropic, we have not only a vertical sun, but longer hours of sunshine than in places farther south. Therefore places a little north of the tropic will be hotter than places south of it. In other words, the great Indo-Gangetic plain (our second region) will, in May, June, and part of July, be hotter than places farther south, for two reasons—(1.) the sun is higher; (2.) he stays longer above the horizon. Conversely, in the winter months, places north of the tropic will be much colder than those south of it, for a double reason—(*a*) the sun does not rise so high; (*b*) he does not shine so long. In May and June the thermometer rises three or four degrees higher in Allahabad than it does in these months in Madras; but in January and December it falls 20 degrees lower.

As a general rule, the *daily* change in temperature at places near the equator is greater than it is at places in higher latitudes, while *annual* changes in temperature are much greater in high latitudes than in low latitudes.

2. **Altitude.**—The temperature of a place depends on its height above sea-level—the higher a place is, the lower is its temperature. Thus, as a rule, places on the plains are hotter than places on mountains or table-lands. On the highest peaks of the Himalayas, although the sun be shining brightly, the ice and snow never melt—it is always freezing. At Ootacamund cricket ground, in the Nilgiri Hills, in May, when the midday gun fires, the sun is directly overhead, and the wickets have no shadow, but it is not much warmer than it is in England at the same time. This is owing to the height of Ootacamund (7,200 feet) above sea-level. The

thermometer, the instrument by which we measure temperature, falls 1° F. (one degree Fahrenheit) for every 333 feet of rise above sea-level

3. **Nearness to the Sea.**—The sea is the great equaliser of temperature all over the world. It warms the cold countries which it touches, and cools the hot ones. The reason of this is as follows: water requires a greater quantity of heat to raise its temperature than any other substance. The heat which raises a kettle of water on the fire to boiling point (212° F.) would raise any other substance of the same weight to a much higher temperature And just as water absorbs a great quantity of heat in order to raise its temperature even slightly, so it gives out a great deal of heat without getting much cooler. To put it shortly, water, or the sea, gets heated slowly and cools slowly Land, on the contrary, heats quickly and cools quickly. Thus in India the coast districts have a much more equable climate than those inland, because the sea prevents the coast districts getting so much heated as they would otherwise do. This is one of the reasons why in May the heat of the plains far from the sea in always greater than that of places on the coast, and why in the cool months of January and February it is always less. The sea prevents Bombay from getting so hot as Lahore in the hot months, and from getting so cold in the cold months. In India, on a hot day, a stone, or the ground exposed to the sun, is sometimes almost too hot to touch; but water always feels cooler than the hand This shows how much more slowly water gets heated than other substances.

4. **Direction of Mountain Ranges.**—The climate of a country is also much affected by the nature and direction of **the prevailing winds.** In the northern hemisphere, if these winds come from the north, they will, as a rule, be cold: if from the south, worm: if they blow from the land they will generally be dry, and if from the sea (the great source of moisture), they will be damp. India, as we shall see, owes everything to its prevailing winds. As it is a peninsula projecting far into the ocean all winds that come to it from the southward will be moisture-bearing winds.

Now, ranges of mountains have a great influence on the climate of a country, by either turning or stopping winds, and by catching the vapour of moisture-bearing clouds.

Most fortunately there are no really north winds in India. Wind does not often come from a high level, such as the table-land of Tibet, to a low level such as the plains of the Ganges, and, besides, there is the great barrier of the Himalayas. These mighty mountains stop the cold northern blasts from reaching India, which is thus protected from the drying winds that blow over Tibet and keep it barren and bleak. Owing to this protection of the Himalayas the plains of India enjoy, during the winter months, a milder climate than the plains of China in the same latitude, for the latter are not protected from the cold north winds.

But the Himalayas do more than this: they also prevent the moisture-bearing winds from the ocean passing out of India. They bend them along their southern edge right up the Brahmaputra and Gangetic valleys and drain them of moisture, which afterwards, in the form of rivers, fertilises the whole of the north of India. At the western end of the Indo-Gangetic plain, in the spring months, there are, indeed, cold, dry, north-western winds from the comparatively low table-lands of Baluchistan and Afghanistan which keep the climate in these months very cool: and when these winds stop they allow the south-eastern wind to bring up rain for the spring crops.

The Western Ghats and the Arakan Yomas (in Burma) have, as we shall see, in the same way, a very important work to do for the moisture-bearing winds from the south-west, but, luckily, they are *not high enough to* stop these winds from passing over them into the country beyond.

Dampness and Dryness.—The hotter air is, the more moisture it can hold. By dampness we mean not merely the amount of moisture in the air, but the amount it contains compared with the amount it can hold at its temperature. Air which is very hot may have much moisture in it, but it is not damp, because it can hold much moisture and is *thirsty* for more. If the same air were cool, it would no longer be thirsty air, but would readily give out its moisture and would be damp. It is the *thirstiness* of the air and not the amount of moisture it contains that is important. For example, in the plains of India during the hot months the air is very dry and *thirsty*, and sucks up moisture from everything. It dries up plants and kills them. But it is much

less distressing to the human body than cooler air which is damp, because it quickly dries up the perspiration of the skin, and this evaporation makes it feel cool. On the other hand, in places where the air is damp, vegetation is not shrivelled up so much. But the perspiration of the body is not dried up, and we feel hot and uncomfortable. Most people would prefer the hot, dry, thirsty air of the Punjab in May, at a temperature of over 100°, to the damp atmosphere of the west coast (say Malabar or Cochin) in the same month, though the temperature is 10 or 20 degrees lower.

Bengal, Assam, the islands in the Bay of Bengal, and the west coast are places with a damp climate, and there we find vegetation, especially trees, flourishing. The dry parts are Baluchistan, the Punjab, Rajputana, Gujarat (the parts away from the coast), and Central India. Places across the Himalayas, such as Leh in Kashmir, are also very dry. In these places there is very little vegetation, and the trees are few and small. In books describing travels in Baluchistan, Tibet, and the Inner Himalayas, the pictures of the scenery show bare hillsides.

It is important to remember that dry air allows heat to pass through it very rapidly: hence in places which have a dry climate the heat of the sun during the day is stronger, but, after sunset, the heat from the ground radiates more rapidly than would be the case in damp air.

5. **Nature of the Soil.**—The climate of a country, or of a particular place, is also influenced by the nature of its soil. Sand is the opposite of water, being very quickly heated and quickly cooled.* Thus, in the lower parts of the Indus valley, the sun beating on the desert sand makes the day very hot; but at night the heat is very rapidly radiated in the dry air, and it is often cold enough to freeze water. From this region hot winds blow eastwards, often causing dust and sand storms in the hot weather. If the soil is clayey, it will hold a great deal of water below the surface, and will only give it up very slowly. One reason for the fertility of the Ganges valley is that the soil, being mixed with clay and

* Since water becomes heated and cooled much more slowly tha land, soils which can keep in moisture for a long time will get war or cold more slowly than soil, such as porous sand, which does n retain moisture.

finely powdered, retains the rain, which easily sinks deeply into it. In the alluvial soil of the coast-strips, water can easily be got by sinking wells. On rocky soil the heavy rainfall quickly runs off the surface into nullahs, and is lost. Almost all of the Deccan table-land (except the north-western part) is made up of a soil lying on the top of hard crystalline and sandstone rocks which allow the rainfall to disappear quickly into the rivers. Some parts of India, especially the north-west part of the Deccan, are blessed with a peculiar kind of soil, called black cotton soil, which requires no manure and retains the moisture for a long time after the sun has baked its surface. One reason why the Government of India has undertaken the preservation of forests is because it is found that if the forests are allowed to be burned and cut down, the soil cannot retain the moisture, which is quickly evaporated, or runs off and is lost.

Thus, if we wish to find out the climate of any part of India, we must know several things about it—how far is it from the equator?—how much above sea-level?—is it near the sea or far inland?—what are the prevailing winds?—do they blow from the sea or the land?—is it protected from moist sea-breezes by mountains?—is it situated in dry, sandy soil, or in the midst of forests?

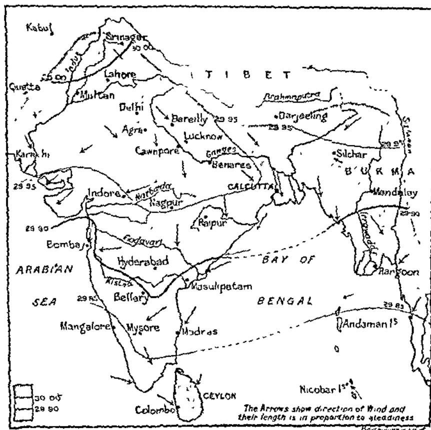
Again, if we wish to know the climate of a place in India at any particular time of the year, we must remember that (1.) if it lies north it will be hotter in summer and colder in winter than its position north of the equator would lead us to believe; (2.) if it lies in the path of moisture-bearing winds it will be cooler and damper, when these winds blow, than other places farther north which do not get these winds.

THE MONSOONS.*

Cause of the Monsoons.—The changes of the monsoon depend on a simple principle—namely, that air has weight or pressure, and that it always flows from a place where the pressure is greater towards one where the pressure is less. This flow of air is called wind, and the strength of the wind

* Monsoon, Arabic *mausim*, means "season," and the monsoon is therefore the seasonal wind.

depends on the greater or less difference in air pressure between the place from which it comes and the place to which it goes. The chief cause which alters the pressure of the air is heat; if air is heated it expands, and its pressure

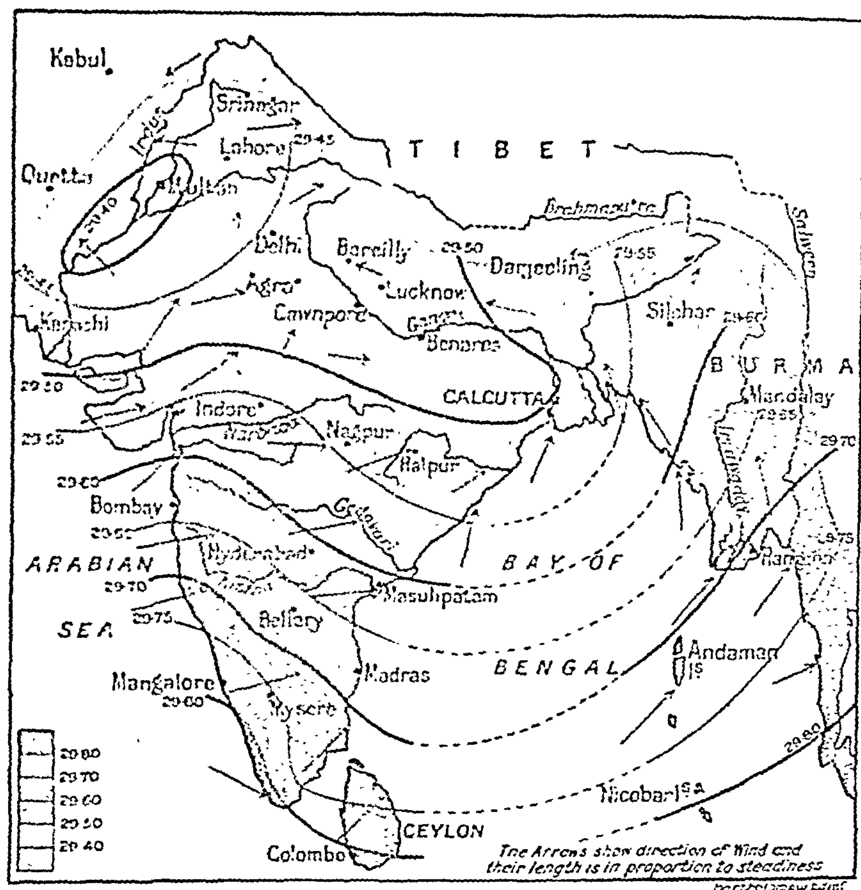


9 PRESSURE AND WIND IN NOVEMBER.

is lessened. The pressure of air is measured by the barometer.

Now, as we have seen, in Northern India during March, April, and May the heat is very great; there is, therefore, a great mass of heated air lying over the land, and as this air gets hotter, it expands and rises, and its pressure gets less. At the same time, in the ocean south of the equator, there is an increase of pressure. Consequently, a great flow

of air (wind) gradually sets in from the southern ocean towards India. As this wind blows over thousands of miles of sea-water, it is full of moisture. This moisture-bearing wind is called the south-west or summer monsoon.



10. PRESSURE AND WIND IN JULY.

There is another law of the atmosphere which we must remember. It is that the amount of moisture which the air can hold in an invisible form (vapour) depends on the temperature of that air: the hotter the air is, the more vapour it can hold; and, conversely, if air containing vapour be cooled, some of its moisture is condensed in the form of rain or dew. Ordinary air always contains a certain amount of moisture which we cannot see. If a vessel be filled with

ice, a heavy dew soon gathers on its surface, because the vessel containing the ice has cooled the air round it: the air can, therefore, no longer hold its moisture, which is deposited on the vessel. Rain is "stronger" or heavier in warm countries like India than in cold, because there the warm air can hold more moisture suspended in it.

Now the land to which the moisture-bearing wind rushes is really hotter than the wind, and so would naturally heat it as it passes over, and thus allow it to take up even more moisture. But though the land as a whole is hotter, the mountains, being high, are much cooler. Therefore, when the monsoon comes to mountains it will be cooled when it tries to cross them, and the vapour it carries will be condensed and fall in the form of rain. This is exactly what happens.*

Arabian Sea branch of the Summer Monsoon.—As the monsoon comes rushing up from the south-west, it strikes the line of the Western Ghats nearly at right angles. It is forced to ascend these Ghats, and, as it becomes cooler in this process, the moisture in the wind is very rapidly condensed, and falls in torrents of rain. This monsoon blows during June, July, August, and September, and during these months over 100 inches of rain, on an average, fall on the Ghats and the strip of coast between them and the sea. The force of the wind is often very great: as it passes over the Ghats it is sometimes strong enough to blow a man on horseback over. During the height of the south-west monsoon the sea on the west coast is very stormy, and the few harbours are closed, except the protected port of Bombay.

But the monsoon passes over these mountains, and though it loses much of its moisture there, it has still some to spare for the Deccan table-land. The rainfall here is, however, very much smaller than on the Ghats. On the seaward face of the Ghats the rainfall is over 100 inches, while just a few miles inland it falls to about 25.

Farther up the coast, however, the shape of the land is different. At the north end of the Western Ghats the Satpura and Vindhya Mountains run at right angles to the coast.

* Moisture-bearing air, when ascending mountains, not only goes into a cooler region, but into one where the pressure is less It therefore expands, does work, becomes cooled by doing so, and some of the vapour contained in it is condensed.

Here, therefore, the monsoon, running between these rang as through a funnel, will reach farther inland before it cooled, and it will be discharged on these hills and on th other ranges which continue them.

Still farther north again, in the part of the coast betweer Cambay and Karachi, we see there are no mountains to catch the monsoon. Instead of them we have a hot, flat plain stretching right up to the foot of the Himalayas. Hence, at this part, the monsoon, finding no obstruction, rushes straight across without shedding any rain till it reaches the slopes of the Himalayas, where, as in the case of the Ghats, it deposits its moisture in the form of rain. This is the reason why the part of India lying inland west of the Aravallis, and to the north and north-east of the coast between Cambay and Karachi, is so arid and barren. It is here that we find the Great Indian Desert. Some parts of Sind receive only 3 inches of rain in the year.

There is one range of hills on the edge of this region—the Aravallis—and here there is more rain than on the plain. Mount Abu, the highest peak, gets an average of 60 inches.

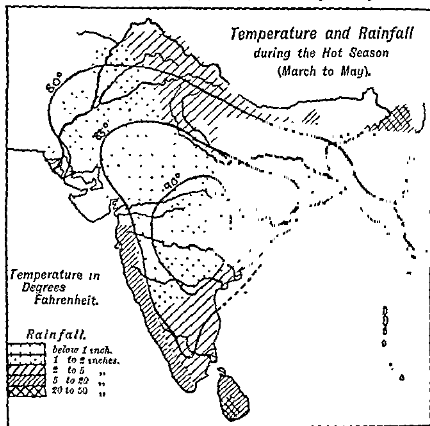
Baluchistan, on the Iranian table-land, is very dry. The country to the west of the Sulaimans is outside the path of the monsoon, and is therefore almost rainless.

Bay of Bengal branch of the Summer Monsoon.—Another branch of the monsoon comes up the Bay of Bengal laden with moisture. One part of it strikes Burma, and meets the mountains. All the Burma mountains have, like the Ghats, a very heavy rainfall, and the strip of country between them and the sea is the wettest part of the Indian Empire.

But that is not all. The monsoon also strikes the Ganges delta, and the Garo, Khasi, and Jaintia Hills. Here the rainfall is very heavy. The monsoon has suddenly to ascend a height of 5,000 feet at Cherra Punji on the Khasi Hills, and the torrents of rain that fall at this station are the heaviest in the world. The average is 480 inches, and in 1861 no less than 805 inches, or 67 feet, were registered!

Beyond this the monsoon current is checked by the barrier of the Himalayas. One branch rushes up the Brahmaputra valley, which is, therefore, one of the wettest districts of India. The other branch is turned by the Himalayas, and passes up the Ganges valley. This part of the monsoon is

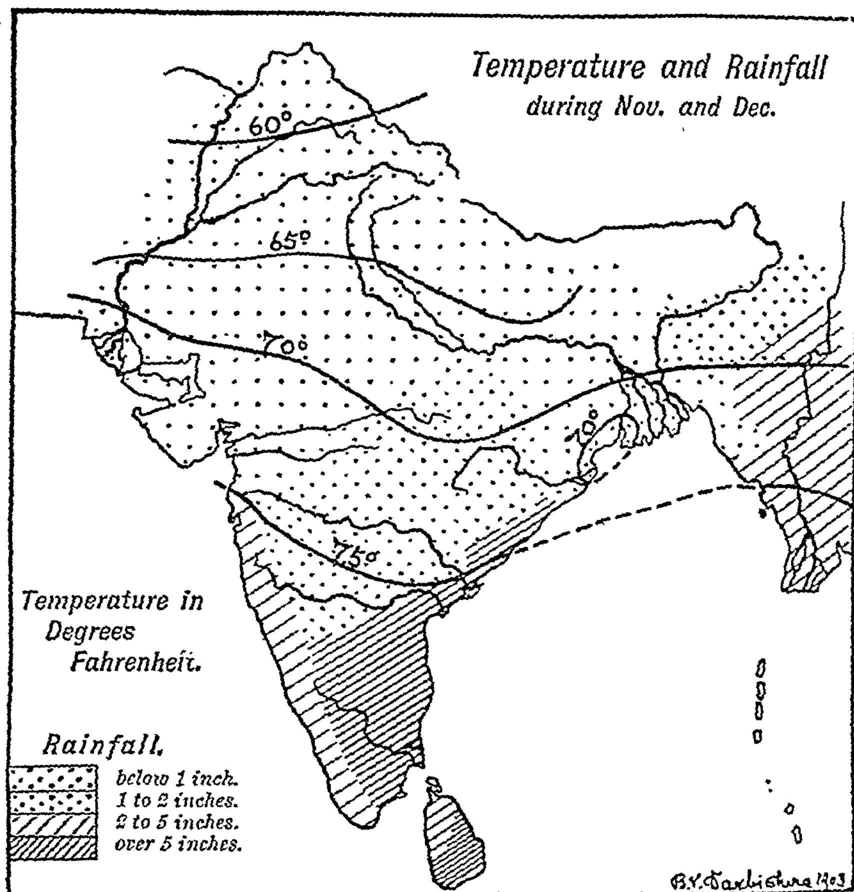
very important, as it gives rain to the most fertile and thickly populated part of India. Three things ought to be noted about it: (I.) Being bent round by the Himalayas, it blows up from the Bay, and is thus a south-east monsoon in this part of India. (2.) Very little of it gets beyond the



II. TEMPERATURE AND RAINFALL DURING THE HOT SEASON (March to May)

Himalayas. For example, Murree, a hill station on the south face of the mountains, receives about 34 inches in the four monsoon months, while Leh, which lies beyond them, only gets a little more than 1 in the same time. (3.) It generally gets weaker and weaker as it passes up the Ganges valley, and it gives more rain on the north side of the valley, next the Himalayas, than on the south side.

Thus, during the monsoon, Dacca, at the eastern end of the Indo-Gangetic valley, receives about 50 inches, while Peshawar, at the other end, receives only $4\frac{1}{2}$. Half-way up the valley, Agra, on the south side of the valley, receives 23 inches; Bareilly, on the north side, 36.

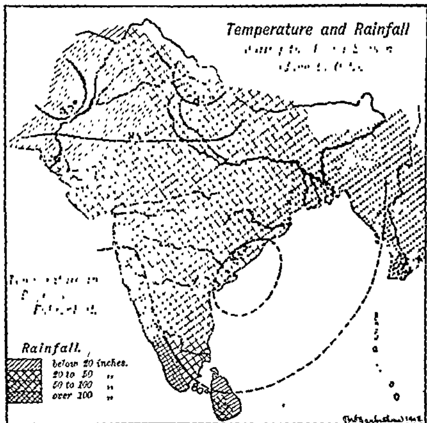


12. TEMPERATURE AND RAINFALL IN NOVEMBER AND DECEMBER.

We should also notice that this part of the summer monsoon *distributes* rainfall much better than the part which strikes the Western Ghats, because, instead of being driven suddenly across a line of steep high mountains, it advances up a broad plain which rises only very gradually with distance from the sea. It meets the mountains sideways, not face to face. When the front part of the monsoon is stopped by mountains

the back part in the plains is also checked (and falls as rain), just as when the engine of a train stops the check is felt all along the carriages.

About 90 per cent. of the rain of India falls in the summer



13. TEMPERATURE AND RAINFALL DURING THE RAINY SEASON (June to October).

monsoon. No wonder that the prosperity of five-sixths of India depends on it.

The snow-line is lower on the southern than it is on the northern slopes of the Himalayas. In other words, snow is more easily and plentifully formed on the side where there is much moisture than on the side where the air is dry. Again, in the lower or eastern end of the Ganges valley, there are more rivers, and much more vegetation, both on the plains and on the hills, than in the upper or western end.

The North-east or Winter Monsoon.—The south-west monsoon blows for four months—June, July, August, and September. By the end of September the pressure of the air in Northern India and Burma has risen. The consequence is that the moisture-bearing south-west current of air, still blowing into the Bay of Bengal, cannot penetrate into these high pressure regions, turns round the area of low pressure, now lying over the bay and not in Northern India, and strikes the southern end of the peninsula. It will strike this part of the land from a north-easterly direction, and it is called the north-east monsoon, though it is really the Bay branch of the south-west monsoon turned round, and is better named the winter monsoon. This monsoon gives rain to the districts north and south of Madras. This is fortunate for these districts, as they are very little helped by the south-west monsoon. The east coast districts, south of Madras city (unlike those on the west coast), get half their annual rainfall in October and November.

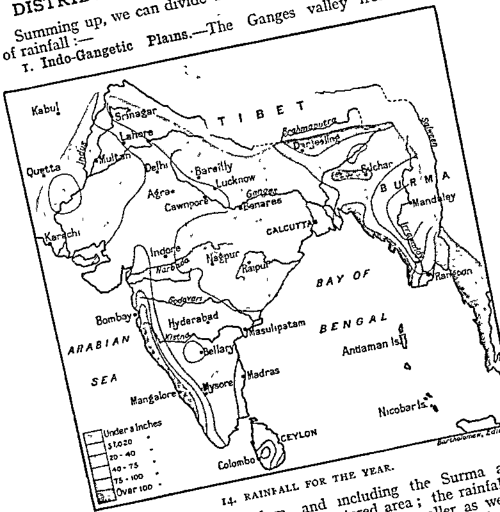
Storms.—During the monsoons, there are heavy cyclonic storms which sweep across the country and give a deal of rain to parts of India. In the months of July, August, and September, storms often come up from the Bay of Bengal and strike across India in a westerly or north-westerly direction, giving rain to the thick part of the peninsula towards the Satpuras, and even up to the Aravallis. In October, November, and December, these storms form in the south of the Bay and are sometimes very severe and cover a large area. Sometimes they travel westwards over the peninsula giving a deluge of rain over the south. In March, April, and May, small rain-storms occur in Bengal, known as "north-westers."

Winter Rains of Northern India.—The large amount of snow on the Himalayas, and cold, north-westerly winds from the Iranian table-land, cool the damp air in the north-west of India, and produce rain on the Lower Himalayas, the Punjab plains, and the United Provinces in winter and early spring. During this part of the year the extreme north-western districts receive more than half their rainfall.

DISTRIBUTION OF RAINFALL IN INDIA.

Summing up, we can divide India into four great regions of rainfall :—

1. **Indo-Gangetic Plains.**—The Ganges valley from the



14. RAINFALL FOR THE YEAR.

delta up to the Jhelum, and including the Surma a Brahmaputra valleys, is a well-watered area; the rainfal very heavy at the eastern end, and gets smaller as we westwards. It is also heavier in the northern than in southern half of the valley. Bengal and the Brahmap valley are thus safe from famine.

2. **Coast-strips.**—(1.) The *west coast* from the Tapti to

Comorin is splendidly supplied with rain, and has an average of over 100 inches. Famine is unknown on this coast. (2.) The *east coast* from the Ganges delta to Cape Comorin is fairly well supplied, as it gets rain in both monsoons and in storms; its average is nearly 50 inches.

3. **The Table-land Region of the Deccan and Central India.**—Here the rainfall is small and uncertain, except in the north-east corner, including the Central Provinces and Chota Nagpur.

4. **The Dry Area.**—The Indus valley, with Baluchistan on one side and Western Rajputana, up to the Aravallis, on the other, is very dry. A great part of the country is therefore rainless and desert.

EXAMPLES OF CLIMATE.

REGION OF MOUNTAINS.—HIMALAYAS.

Leh in Kashmir.

Latitude.—About 34° N., therefore well within the Temperate Zone.

Height.—11,500 feet above sea-level, therefore the barometer stands usually below 20 inches—that is, nine inches lower than a barometer at sea-level. The mean temperature for the year is only 40° F.

Nearness to Sea.—Leh is 1,000 miles from the sea, and has, therefore, a continental climate—that is, the sun in summer is hot, and in winter the thermometer sometimes falls below zero.

Directions of Mountains.—The Himalayas shut out the monsoon, hence Leh is one of the driest spots in the world. Owing to the extreme dryness of the air the snow-line here is very high—19,000 feet. The rainfall and snowfall together only amount to about 2½ inches in the year. Hence agriculture is entirely dependent on irrigation. The winds at Leh are generally light, as the place is shut in by mountains and quite removed from the influence of the monsoons. The air is very dry, hence when the sun is shining it is very hot, but after nightfall the cold is intense.

Nature of Soil.—There is little vegetation to retain the moisture.

Simla.

Latitude.—About 31° N., therefore well within the Temperate Zone.

Height.—7,000 feet above sea-level. The barometer stands usually about 23.2 inches. The mean temperature for the year is 55° F.

Nearness to Sea.—Simla is 700 miles inland, and the sea has no influence on its climate. June is hot, but January is cold.

Direction of Mountains.—Simla lies on the outward face or spurs of the Himalayas, which receive the full force of the summer monsoon. Its rainfall is 70 inches on the average, and of these 50 inches fall

ing the monsoon. In August it rains two days out of three. nla being among the hills, the winds are light except in the monsoon. *Nature of Soil.*—The hillsides near Simla are bare, but in the station self many trees have been planted, which retain the moisture.

REGION OF PLAINS.

Jacobabad in Sind.

Latitude.—About 28° N., or about 5° north of the Tropic of Cancer, therefore close to Torrid Zone.

Height.—160 feet above sea-level on the Indus plain; so has none of the cool climate of elevated places like Leh and Simla.

Nearness to Sea.—About 250 miles from sea, and out of its influence.

Direction of Mountains.—The wind mostly comes from the dry highlands of Baluchistan, which keeps this part of Sind very parched. In the summer monsoon the wind is, of course, from the south-west, but little or no rain falls, as there is no opposing hill-face to arrest and condense the moisture, therefore Jacobabad only receives about 4 inches in the year. The dryness of the air in this part of Sind is very great, hence in summer the heat is intense, and Jacobabad is the hottest place in India. The thermometer has been known to touch 126° in the shade. In winter again, for the same reason, the nights are very cold, and water sometimes freezes.

Nature of the Soil.—Sind as a whole is a sandy and stony waste, hich is quickly heated by the sun in the day, and quickly radiates he heat at night. Just round Jacobabad, however, there is some rrigation from the Indus; magnificent trees flourish, and crops are reaped. This prevents the place from being so disagreeable to live in as it would otherwise be.

Lahore in the Punjab.

Latitude.—About 32° N., and therefore in Temperate Zone. Average temperature 75° F.

Height.—Only 730 feet above sea-level on the Indo-Gangetic plain. Its height is insufficient to lower its temperature.

Nearness to Sea.—Its distance inland is too great to allow the sea to have any influence. Hence the climate of Lahore is very hot in summer and cold in winter. In the hot weather the thermometer rises as high as 117°, and in winter sinks to nearly freezing-point at night.

Direction of Mountains.—Like all places on the Indo-Gangetic plain, Lahore owes its rain to the Himalayas, which bend the monsoon along their southern face. But it is too far up the valley, and too far from the mountains, to get much rain, the average being only 22 inches. From April to June a hot, dry wind blows from the west; in June July, August, and September the summer monsoon blows up from the Bay of Bengal. In October the wind changes to the west, and i... cool wind, and the air is dry and clear.

Calcutta on the Ganges Delta.

Latitude.—About 1° (69 miles) south of the Tropic of Cancer, and therefore in the Torrid Zone.

Height.—Unaffected by height: only 20 feet above sea-level.

Nearness to Sea.—Calcutta is 70 miles from the sea, and so enjoys a fairly equable climate. It is never very hot, like Lahore, in the hot months, nor very cold during the cold months.

Direction of Mountains.—There are no mountains near Calcutta. In the early part of the year a dry wind blows from the west, and in June the summer monsoon begins, bringing heavy rain. Out of a yearly total of 65 inches, nearly 50 fall in the monsoon months.

Nature of Soil.—The flat delta land makes Calcutta damp.

REGION OF TABLE-LANDS.

Nagpur in the Central Provinces.

Latitude.—About 21° N., and so within the Tropics.

Height.—1,025 feet, which is enough to keep the average temperature (79°) of the year fairly low for an inland place in the Tropics.

Nearness to Sea.—Nagpur, being 400 miles from either coast, is not influenced by the sea. Thus its temperature is higher than that of Calcutta in the hot weather, and lower in the cool months.

Direction of Mountains.—Nagpur itself is in a plain, but the hilly country of the Central Provinces catches the monsoon clouds. Every wind is a dry wind as it comes over the land, except in the summer monsoon, when the rain-laden clouds are carried in from the sea, and Nagpur receives 38 out of a yearly total of 44 inches.

Bangalore in Mysore, the highest part of the Deccan.

Latitude.—About 13° N., and, so, nearly in the centre of the north Tropical Zone.

Height.—Nearly 3,000 feet. This alone gives the place a moderate climate. Though so far south, Bangalore's mean temperature for the year is only 73°, and even in April, the hottest month, the average is only 80°. The thermometer never touches 100°, but it sometimes falls to 50°, at night, in the cold weather.

Nearness to Sea.—Bangalore is nearly 200 miles inland.

Direction of Mountains.—The Western Ghats keep off the full south-west monsoon rains, but allow the monsoon wind and clouds to pass over this part of the Deccan. Hence June, July, and August are very pleasant. The rainfall is far less than that of the Western Ghats in the summer monsoon, and far less than that of Madras in the winter monsoon,—average, 35 inches. Bangalore, being nearly in the centre of Southern India, receives both the summer and winter monsoon winds.

Nature of the Soil.—The soil is very dry and porous, hence Bangalore is one of the healthiest stations in India.

REGION OF COAST-STRIPS.

Bombay on the West Coast.

Latitude.—About 19° N., and well within the Tropics

Height.—40 feet above sea-level.

Nearness to Sea.—Bombay lies on an island, and hence its climate is equable, the temperature neither rising very high nor falling very low. In May, the hottest month, the thermometer scarcely ever goes above 90°, and in December, the coldest, it scarcely ever falls to 60°, even at night.

Direction of Mountains.—The Western Ghats do two things for Bombay. (1.) In the summer monsoon they catch the moisture brought up from the Arabian Sea, and deposit it on the hills and coasts. (2.) In the early hot months they keep off the hot winds blowing from the Deccan. During June, July, August, and September Bombay is exposed to the full force of the monsoon, and during these months 70, out of a yearly total of 74, inches of rain fall. During the rest of the year the wind is from the west or north-west, and it is a dry wind, so that Bombay receives only about five per cent. of its rainfall outside of the summer monsoon.

Nature of the Soil.—Bombay island is more healthy than it used to be. The soil is naturally damp.

Madras on the East Coast.

Latitude.—About 13° N., therefore the town has a tropical climate

Height.—Only 20 feet above sea-level.

Nearness to Sea.—The position of Madras on the coast gives it an equable climate; it is never so hot in June as places inland on the Gangetic plain. Its average temperature for the year is 82°.

Direction of Mountains.—There are no mountains near Madras to interfere with the monsoon winds. During May, June, and July hot winds blow from the land. The south-west monsoon, having crossed the heated Deccan, is at Madras a hot, dry blast. In October the winter monsoon begins to blow from the north-east, and during the last three months of the year Madras receives most of its average rainfall of 49 inches.

Nature of the Soil.—The abundance of subsoil water and the alluvial soil help vegetation.

√ WATER.—RAIN, ICE, RIVERS, AND THE SEA.

Having dealt with the Climate of India we now go on to consider what effect is produced on a country by water, *i.e.* by Rain, by Snow and Ice, by Rivers, and by the Sea. We must remember that the work done by water is always going on, and has been going on for millions of years. Its effect is therefore enormous.

Rain rubs down the surface of the ground partly by dis-

solving it and partly by washing it off. In this way it gradually lowers the surface of a country and brings the different parts nearer to the same level. Of course much depends on the quantity of rain and the suddenness with which it falls. Where only gentle rain falls the work is very slowly done, but in places like Cherra Punji, where the rain comes down in torrents, slices of the hills are quickly torn off and washed away. This work also depends on the nature of the surface —rain has only a slight and gradual effect on rocks, but on soft soil its results are quickly seen. Thus in India, as in other countries, where we see steep hills and a rugged surface, we may be sure that either very little rain falls there, or that the surface is composed of hard rocks. On the other hand, where the country is flat, or the hills smooth and round, we know that rain has gradually made them so.

Subsoil Water.—But rain, besides flowing over the surface, sinks into the ground, sometimes to great depths. Here it flows wherever it can find a way over and among the layers of clay and rock. Thus in most parts of India there is an underground water level. Some of this water comes naturally to the surface in springs, but much of it, in order to be used, has to be pumped up in wells sunk down to its level. The alluvial Gangetic plain is the region of India where wells are most easily dug, and where water is found nearest the surface and in greatest abundance. This is because the ground is soft and the plains are supplied by the copious rainfall of the Himalayas seeking the lower level.

In the Bengal end of the plain there are but few wells, n[ot] because the country does not suit them, but because the s[oil] is so moist that no wells are needed. But, at the other e[nd] of the plain, in the dry south-eastern districts of the Punj[ab] the subsoil water is scanty and lies deep down, and th[ere]fore there are few wells. In the same way, in the allu[vial] coast-strips wells can easily be sunk, while in the dry rocky table-land of the Deccan this form of irrigation c[annot] be much used.

Snow and Ice.—In the high valleys of the Himalaya[s] are great fields of ice called **glaciers** formed out of snow. glaciers, which are sometimes hundreds of feet thi[ck] very slowly down the valleys wearing off the surface beds. At their lower ends, at the foot of the valle[ys] glaciers melt, and the melted ice carries down, in t

of mud and gravel, the soil which they have ground off the slopes of the mountains. This melted ice, with its mud, finds its way into the streams which feed the rivers.

In this way the glaciers of the Himalayas feed the rivers and fertilise the plains below. The Himalayas are the only part of India where it is cold enough for the formation of glaciers.

Rivers.—Rivers are the natural drains of a country, carrying off to the sea the water not wanted by the land. In India, where the heat of the sun is very great, all rivers lose much of their water by evaporation, and those which are not fed by tributaries, *e.g.* the Lower Indus, become smaller as they go on. Many rivers in the hot months nearly dry up altogether, and we must remember this when looking at a map of India and comparing its rivers with those of other countries. The rivers of the Deccan (which receives very little rain from November to April) are only kept supplied during these months by springs which feed them and their tributaries. Some rivers also, such as the Upper Ganges and the Kaveri, are drained of much of their water by irrigation canals. Along the banks of the Lower Indus are canals dug to take off the surplus waters of the river when in flood.

All rivers, of course, flow from a higher to a lower level, and the rate of their currents will depend on their slope, the volume of their waters, and the smoothness or roughness of their beds. The work which rivers do depends greatly on this rate of flow. Rivers do three things which alter the face of a country. They eat away their channels and their banks, they carry down mud and silt, and they deposit what they carry off either on their banks or at their mouths.

Where a river is flowing very fast, *e.g.* down the steep slope of mountains, it does its work quickly. The force of the water tears away mud, gravel, and even large stones. The gravel and stones are deposited at the foot of the mountains, where the current loses its power, but the mud, being light, is carried on. The work a river can do depends also on the rapidity and suddenness with which it does it. If all the rain in India were spread over the whole year in gentle showers every day, the amount of water carried by the rivers annually would not be nearly the same, owing to its being sucked up by the sun and the soil, and the work done by the rivers would be far less than it is. In India as a whole the

rainfall is confined to a few months of the year,* and in some places it is very heavy. Therefore a great deal of water is, in a very short time, poured by brooks and tributaries into the main rivers, and they rise in great floods. It is during great floods that they do most of their work. When a flooded river enters a flat plain, it begins to drop its mud and silt on its bed, which is thus raised till it is sometimes higher than the surrounding country. Then, when another flood comes, the stream will probably break through its banks and spread its waters far and wide over the low level plain. The river thus constantly shifts its course until it has visited in turn every part of the plain, raised it and levelled it. These operations are seen taking place on a large scale in the Indo-Gangetic plain. One reason why the work of Indian rivers is so great is that there are no lakes which in other countries break the force of a flooded river and catch its silt.

A good illustration of the enormous work done by ice, snow, rain, and rivers is seen in the case of the Himalayas. Here, high up on the peaks, the frost is very severe and splits up the rocks, the huge glaciers grind down the sides of the mountains, the rocks of the slopes are softish, the rainfall and snowfall are very heavy, and the rivers have steep courses. All these causes favour a great rubbing down of the surface, and we have an enormous amount of mud and silt brought down to the Indo-Gangetic Plains or carried out to sea. In the case of the Deccan Table-land, however, there is no snow and very little frost even on the highest of the Ghats, the rocks are very hard, the rainfall is lighter, and more of it is sucked up by the sun, the rivers are less steep, and in consequence the silt they bring down to the coast-strip is much smaller in amount.

Deltas.—When a river approaches the end of its journey near the sea the strength of the current, owing to the flatness of the country, is very weak, and here it deposits its burden of silt in layer after layer. This mud, by the growth of vegetation and by the addition of new silt brought down in floods, is raised to a higher level than the surrounding land. Another change also takes place. The river no longer receives tributaries: instead, the mud it deposits having choked up its channel, the flow is checked and the water spills in

* India receives 90 per cent. of its rainfall during the south-west or summer monsoon. (See Maps 12 and 13.)

distributaries over the low land to the sea. These distributaries in turn become choked up in the same way and in turn split into smaller distributaries till the whole region is a network of sluggish muddy streams. The fan-shaped or triangular piece of land enclosed between the point where a river begins to split up and the mouths of its farthest separated distributaries is called a delta.* Here, of course, the current is very slow, and the mud brought down is constantly being deposited and makes the delta larger

[illegible] mouths and stops
[illegible] carried down by
[illegible] we can scarcely
picture it in our minds. Thus the Ganges, Brahmaputra, and Meghna together, during the four months of the rainy season, bring down and deposit on their delta and sea-shore as much soil as all the people of Bengal could carry there in a year

The Sea.—(1) **Currents.**—During the months when the summer monsoon blows, it drives a sea-current (along both coasts of India and the coast of Burma), carrying sand with it. On the west coast of India this sand is carried into the ports, or forms *bars* across their entrances. This also explains why the Gulf of Cambay, the Ranns of Cutch, and the mouths of the Indus are becoming shallower On the east coast the same thing happens, and the sea here is therefore very shallow for a long distance out from the land. Thus, vessels on the east coast have to lie in "roads" or anchorages, sometimes as far as 10 miles off the shore. Madras harbour was in constant danger of being blocked up by this sand-laden current, but its entrance has lately been improved by being turned northwards or away from the current. The shallow water at the mouths of the Ganges is likewise caused by the sea-current meeting the fresh water of the river and making it deposit its silt. The estuary of the Hooghly has to be dredged constantly in order to keep a passage clear for vessels. The sea-current flowing northwards meets the Ganges and Irrawaddy rivers *face to face*, and so more silt is deposited in their deltas than in the deltas of the Kavari, Kistna, Godavari,

* To the country at the mouth of the Nile the Greeks gave the name *delta*, because in shape it resembled their letter Δ (delta), and this name is now given to all similar accumulations a[illegible]e mouths of rivers.

and Mahanadi, where the current sweeps *past* their edges and carries away much of the silt they bring down.*

(2.) Tides.—The attraction of the sun and moon causes a wave of high water called a tide to go round the world. Far out at sea this tide has very little influence, but when it comes to shallow waters along the shore, and especially when it moves into narrow spaces such as estuaries or inlets, the rise and fall of water is very powerful. For example, on the Hooghly, in the Gulf of Cambay, and at Rangoon, where, owing to the shape of the coast, the water is cooped up into a narrow space, there are high and low tides, while at Madras, or Calicut, or Colombo (in Ceylon), where the coast is open and unbroken, there is scarcely any tide.

It is very easy to understand how this daily rise and fall of the tide in the ports of Calcutta and Rangoon helps the commerce of those places. Without this tidal current a vessel drawing over 11 feet of water could not navigate the river Hooghly, but, with the tidal current, vessels drawing 27 feet of water and more have proceeded to sea from this port. In the same way, were it not for the tide flowing up and down the Rangoon River, ships would have to load and discharge cargo many miles from Rangoon town. The Hooghly, Meghna, and Sittang (in Burma), are subject to very high tides called *bores*. These take the form of high walls of water rushing up the river at great speed. They of course obstruct navigation, but sailors and boatmen know when to expect them.

* Anyone on the sea-shore can test the force and direction of such a current by throwing a piece of wood into the sea and watching it drift.

THE RIVERS OF INDIA.

Preliminary.—From the rainfall and the relief of the land of India it is easy to understand the river systems. Before, however, going into the details of the separate rivers of India, there are two general rules we should remember.

1. In India the rainfall takes place in certain fixed seasons (in most places during the summer monsoon months, June, July, August, and September), while but little rain falls during the rest of the year. Besides, in a hot country like India there is a great deal of evaporation. Therefore, during most of the year there is very little water in many of the rivers, and some of them are mere dried-up water-courses. The maps show the course of the rivers as they are only during the rains.

If, however, a river comes from mountains covered with perpetual snow and ice, it will have water in it even in the hot weather, for then the snow and ice are melted by the sun.

2. The course of a river depends on the kind of country it flows through—whether it is flat and soft, or steep and rocky. Up in the mountains, or over a table-land, a river usually passes over a rocky bed from which it cannot escape; but on the plains it generally flows over sand and mud, through which it can quickly cut a new channel for itself. Thus some rivers in the plains of India are constantly changing their course. Conversely, if on the map we see a river has many channels or breaks up into a delta, we may be sure that the land there is very flat and soft.

Three stages in the course of a river.—Most Indian rivers have three stages in their journey to the sea:—

1. **Mountain stage.**—Among the mountains a river is generally rapid, the slope being steep, and the water has great force, often cutting out a path for itself in the solid rock and sweeping off soil and gravel.

2. **Plain stage.**—The second stage begins where the river

leaves the mountains and enters the plains. Here the slope is much less, and the speed of the current is much slower. The river, however, always keeps to the lowest level it can find, and gradually wears out a channel for itself; and as the channel deepens, the swamps on either side drain into it and become dried up.

3. **Delta stage.**—When a river reaches the strip of flat country near the coast, it is very nearly at sea-level. The mud it has brought down in the course of ages has raised its bed above the surrounding country, and consequently its waters spill over in separate streams, called distributaries, which enter the sea at different points of the coast. The triangular bit of country enclosed between the point where the river begins to split up and the mouths of its farthest separated distributaries is called its delta.

These three stages can be traced in most Indian rivers, but they are most marked in those of the Indo-Gangetic plain.

River Systems.—The river systems of India are:—
(1.) The **Indus-Punjab System.**
(2.) The **Ganges-Brahmaputra System.**
(3.) The **Rivers of the Deccan.**

THE INDUS-PUNJAB SYSTEM.

THE INDUS AND ITS TRIBUTARIES.

Drainage.—This system drains the western third of the Himalayan Ranges, the Trans-Himalayan Ranges of the Kailas, the Karakorams, and the Hindu-Kush, and the Sulaimans.

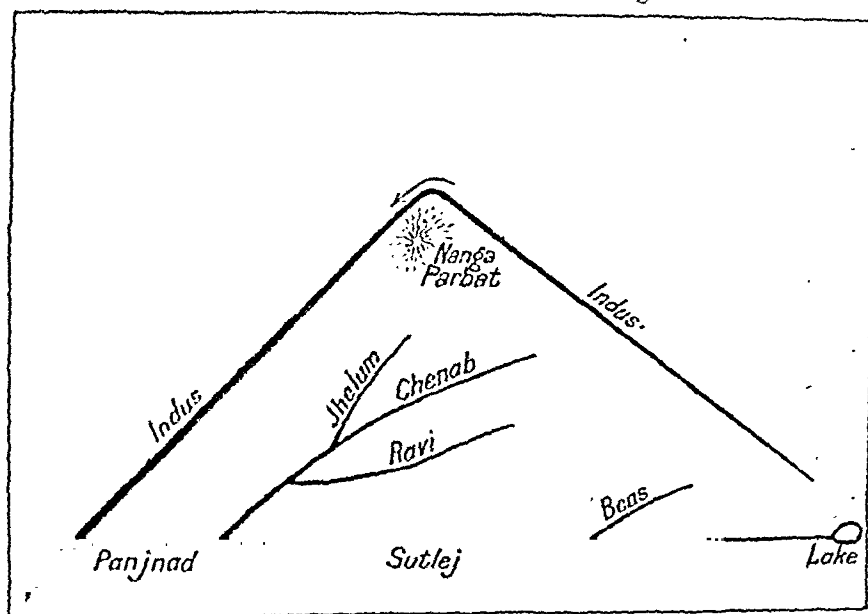
The Indus.—The source of the Indus lies right beyond the Himalayas, in the lake region of Tibet, 18,000 feet above sea-level. [*See maps* 15 *and* 16].

Course.—(1.) North-west up to the bend round Nanga Parbat (one-third of total). (2.) South-west from bend to sea (two-thirds of total). Total length nearly 1,800 miles.

Stages.—(1.) The *mountain stage* extends from its source, round the bend, and up to the point where it cuts through the Salt Range and enters the plains. During this stage of 800 miles it falls 17,000 feet, which means that its current here is very rapid. At a point near the Nanga Parbat bend

little cultivated, and owing to the shallowness of the sea outside the delta (caused by deposits of silt from the river) it is quite useless for the navigation of large vessels.

Tributaries. *Right bank.*—The **Shyok**, from the Karakoram *glaciers*; *the* **Gilgit**, *from the southern slopes of the* Hindu-Kush, entering near the bend; the **Kabul River**, entering near Attock, and bringing, with its tributaries the **Kunar and Swat**, the drainage of Eastern Afghanistan; the **Kurram** with its tributary the **Tochi**, and the **Gomal** with its feeder the **Zhob**, both from the Sulaimans. For the remaining 600 miles of its



16. ROUGH MEMORY MAP OF INDUS AND FEEDERS.

course, after receiving the Gomal, the Indus has no feeder of any size on its right bank.

(1.) The Kabul, Kurram, *Tochi, and Gomal run* through valleys which form routes to Afghanistan, and the Gilgit valley leads to Northern Kashmir.

(2.) They are all mountain rivers fed by snows; they are therefore rapid.

Left bank.—The S[illegible] argest of the tributaries, rises in the sacred Rakas Ta[illegible] the sour[illegible] of the Indus; but [illegible]stead of flowing n[illegible] th[illegible]t strikes nearly due west across the [illegible]ab plain, *till* its waters enter the [illegible]uth. The [illegible] and Sutlej th[illegible]e Indus

making the two sides round its bend, and the Sutlej the hypotenuse or base. Within this triangle lie the other four left-bank tributaries, the Jhelum, the Chenab, the Ravi, and the Beas—all from the Himalayas.

The two main tributaries are the Chenab and the Sutlej. The Chenab receives the Jhelum on its right bank, and, a little farther on, the Ravi on the left; it then flows on into the Sutlej, which has early in its course received the Beas. The Panjnad is the name given to the water of these five rivers when they are all joined in one channel. Sixty miles below the junction it in turn joins the Indus. The country through which the left-bank tributaries flow is called the Punjab, which means five rivers (*Panj ab*).

Notes.—(i.) The right-bank tributaries of the Indus have no plain stage, as they enter it either among or close to the mountains. The left-bank tributaries, on the other hand, have a long course through the plains, and are therefore much more important both for boat-navigation and irrigation.

(ii.) The Indus and its Punjab feeders flow out of the melting snows and well-watered valleys of the Himalayas into a dry and almost rainless plain. Hence, unlike most rivers, they become smaller as they go on, through their loss by evaporation and irrigation. East of the Sutlej, two rivers, the Ghaggar and the Saraswati, flow down from the Himalayas, but become dried up and lose themselves in the sandy desert of Rajputana. We can easily see from the map that the country west of Delhi and the Aravallis is very dry, since no rivers rise in that area. [*See map* 15.]

(iii.) The Indus and its Punjab tributaries flow out of mountain valleys into a flat plain; hence their currents are much slower in the second part of their course. The Indus, when not in flood, wanders about among a network of channels and islands of mud.

(iv.) They flow out of a hilly and rocky country into a sandy alluvial plain. Hence, in their upper courses, their beds are fixed, but in their lower courses they easily cut out new channels for themselves, and constantly shift their banks. This is especially the case with the Indus in its delta. Here, east of the present bed of the river, hundreds of ancient channels have been found through which the river flowed in former days, and one of them, the Puran, used to carry the main stream into the Rann of Cutch, 70 miles east of its present mouth.

The Luni River, a salt stream from the Aravalli Hills, flows into the Rann of Cutch. It is generally dry, except after rain.

THE GANGES-BRAHMAPUTRA SYSTEM.

Drainage.—The drainage of this system is fixed by three ranges of mountains—the Himalayas on the north, the Vindhyas and their offshoots on the south, and the line of the Patkai and Lushai Ranges, with their offshoots the Jaintia, Khasi, and Garo Hills, on the east. The rainfall on these ranges and on the plains between them is very heavy, hence the system contains many large rivers. [*See maps 17 and 18.*]

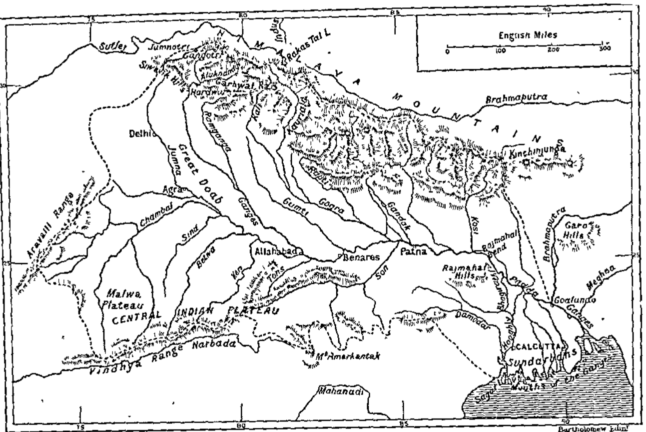
The system will be easily understood if we notice three points on the map: (1.) **Goalundo**, the centre or lowest part of the plain where the Brahmaputra joins the Ganges; (2.) the **Rajmahal Hills**, the farthest spur of the Vindhya Ranges; (3.) the **Garo Hills**, which jut out from the general line of the Patkais. All the drainage of the system falls naturally towards Goalundo, the Ganges bending sharply round the Rajmahal Hills, and the Brahmaputra round the Garo Hills.

THE GANGES.

Course.—For the first part of its course its direction is south, but after getting into the plain it turns more and more eastwards, keeping, however, to the south of the plain, till it rounds the Rajmahal Hills, and then runs through its delta to the sea.

Mountain stage: *Source to Hardwar.*—The Ganges, under the name of the Bhagirathi, rises in the Gangotri glacier of the Garhwal Range of the Himalayas, and is soon joined by the Alaknanda, which is the larger of the two, and, by the strict rules of geography, ought to be considered the source of the Ganges. Shortly after the junction the Ganges finishes its mountain stage by bursting through the outmost range of the Himalayas (the Siwaliks) near Hardwar.

Plain stage: *Hardwar to Goalundo.*—Here the Ganges flows through one of the most fertile plains in the world, and receives almost all its tributaries. Soon after bending round the Rajmahal Hills it begins to give off distributaries. The



17. THE GANGES BASIN.

chief of these is the Bhagirathi, flowing due south, which near its mouth is called the Hooghly, on which Calcutta stands. The main stream (here called the Padda or Padma) continues south-eastwards to Goalundo, where the Brahmaputra joins it, and the deltas of the combined rivers meet.

Delta stage.—The delta of the Ganges is the triangular piece of land lying between the Bhagirathi and the mouths of the Meghna. It will be described along with the delta of the Brahmaputra.

Tributaries.—(1.) *Left bank:* These in order are the *Alaknanda, Ramganga, Gumti, Gogra* (with its feeders the Kali or Sarda and Rapti), *Gandak*, and the *Kosi*—all, except the Gumti, from the Himalayas. (2.) *Right bank:* The *Jumna* (with its tributaries the Chambal, the Sind, the Betwa, and the Ken), the *Tons*, and the *Son*. The *Damodar* enters the right bank of the Bhagirathi, the delta-branch of the Ganges already mentioned.

The Himalaya Feeders.—These include all the left-bank tributaries, *minus* the Gumti, which rises in the plains, and *plus* the Jumna, which enters on the right bank. The Gogra, the Gandak, and the Kosi rise behind the Himalayas in Tibet, and force their way through the ranges. The Jumna, the Ganges itself, and the Ramganga have their source in the inner ranges of the Himalayas.

The **Jumna**, though not the largest tributary of the Ganges, is the most important. It rises in the Jamnotri glacier, not far from the source of the mother stream, and joins it at Allahabad. Though it comes from the snows of the Himalayas itself, it is the channel which, by its feeders, brings into the Ganges a great part of the drainage of the Vindhyas.

The **Gogra** rises near the Rakas Tal Lake, and therefore close to the sources of the Sutlej, Indus, and Brahmaputra, and flows through the Nepal Himalayas under the name of the Kauriala.

The **Gandak** also rises beyond the Himalayas. Three rivers of the same name in the mountains unite to form it.

The **Kosi** rises beyond Kinchinjunga in Tibet, flows westwards till it finds a channel through the great ranges, and then runs nearly due south into the Ganges just before the Rajmahal bend.

The Vindhya Feeders.—These drain the great triangle of the Central Indian plateau. More than half of the Vindhya drainage into the Ganges comes by the Jumna tributaries, the Chambal, the Sind, the Betwa, and the Ken.

The **Chambal** is by far the most important of these. It rises on the crest of the Vindhyas overlooking the Narbada valley,

and drains the Malwa plateau by a number of tributaries. Besides these Jumna tributaries, the Ganges receives the Tons and the Son from the south. The Son rises in the Amarkantak Range of the
and Mahanadi
the Gogra and

The Himalaya and Vindhya Tributaries compared.—To look at the map, one would think that the Vindhya tributaries were nearly, if not quite, as important to the Ganges as those that come from the Himalayas. But here the map deceives us, for :—

(1.) The Vindhya tributaries are not snow-fed. They are therefore dry or nearly dry in the early hot season, just when the snow is melting on the Himalayas and filling the rivers which rise in them.

(2.) The Himalayas have a much heavier rainfall than the Vindhyas; therefore the average flow of the Himalayan rivers is much greater.

(3.) Since the Ganges flows not in the middle of the Gangetic plain, but well in the south of it, the Himalayan tributaries have a long second stage over the flat plain, while the Vindhya tributaries have only a short one. Hence, on the whole, the Vindhyan tributaries are more rapid, and, consequently, of much less use for navigation. Besides, as we have seen, they are nearly dry in certain seasons.

(4.) The Himalayan tributaries in the plains flow through soft loam and mud, while those from the Vindhyas rush through rocky country and over stony beds. Therefore, when rain comes, the Himalayan feeders are only gradually filled, as much of the water soaks through the soil; but in the case of the Vindhyan rivers the water runs rapidly over the rocky surface and quickly fills them. The Vindhyan feeders are therefore famous for heavy and rapid floods. Thus the Chambal, which is usually a small river, brings down, in the rains, as much water as the great Jumna itself. Again, the Son, after heavy storms, has to carry off the rainfall of 21,000 square miles in its channel, and then it suddenly swells to a mighty river a thousand times its size in the dry weather.

(5.) For these reasons the Vindhya tributaries are much less useful for irrigation than those from the Himalayas. It is difficult to make canals in rocky soil and feed them from

rivers which quickly run dry. There is thus no canal irrigation on the Vindhyan rivers except in small tracts on the Betwa and Son after they have entered the flat Ganges plain. On the other hand, nearly the whole of the Doab between the Ganges and Jumna is fertilised by canals.

(6.) Once more, another difference between the Himalayan and the Vindhyan tributaries explains why the Jumna and Ganges do not flow in the middle of the great plain but well towards the south of it. The Himalayan rivers come from steeper slopes, and flow through less rocky country than the Vindhyan feeders do. Hence they bring with them much more silt and mud. They have, therefore, in the course of ages, raised the level of the northern parts of the Jumna and Ganges valley till the beds of these rivers are now close to the southern edge of the great plain.

THE BRAHMAPUTRA.

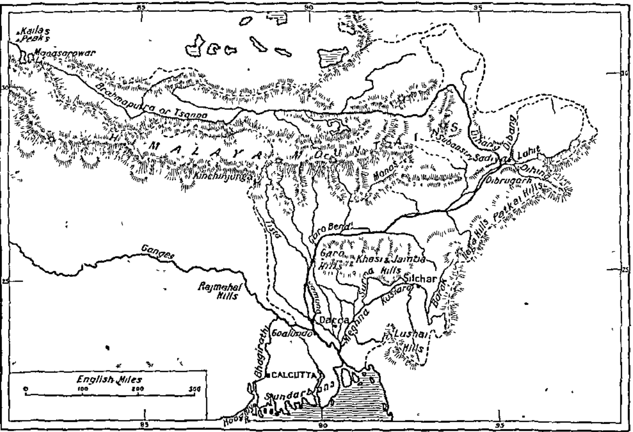
Course.—Eastwards through Tibet to the bend round the eastern end of the Himalayas; then south-westwards down the Assam valley to bend at Garo Hills; then due south through eastern Bengal to the sea.

Stages.—(1.) **Mountain stage**: *from source to Himalayan bend.*—From its source on the slopes of the Kailas Mountains near the Manasarowar Lakes, the Brahmaputra (here called by its Tibetan name, the Tsanpo) flows eastwards along a trough in the plateau for nearly 900 miles, or about half its whole length. Then, after a big bend to the north, under the name of the Dihang, it turns sharp round the eastern end of the Himalayas and enters India.

(2.) **Plain stage**: *from Himalayan bend to Goalanda.*—The second stage takes it for 450 miles nearly due westwards down the Assam valley where in the dry weather it wanders among sand-banks and reeds, sharply round the end of the Garo Hills, and 150 miles dead south to Goalundo, where it joins the Ganges. At Sadiya, close to the Himalayan bend, the bed of the Brahmaputra is only 400 feet above sea-level. We can guess, therefore, that during its plain stage it must flow slowly.

(3.) **Delta stage.**—This will be dealt with later along with the deltas of the Ganges and Meghna.

Tributaries.—In its first stage little is yet known about the



18. THE BRAHMAPUTRA BASIN.

Brahmaputra, and its course for some distance is only guessed on the map.* At the beginning of the plain stage, just after turning the Himalayas, it is joined near the frontier town of Sadiya by several mountain rivers—the Dibang from the north, the Lohit (sometimes called the Brahmaputra) from the east, and the Dihing from the south-east. The Assam valley receives much rain, and here the Brahmaputra is helped by many feeders, but, owing to the narrowness of the valley, they are not long. The Subansiri and the Manas from the Himalayas are the chief. After the Garo corner the Tista joins it from the slopes of Kinchinjunga.

Note.—In its southward course to Goalundo the Brahmaputra is known as the Jamuna. Little more than a hundred years ago the river, instead of flowing due south after the bend as it does now, turned south-eastwards close to the Garo Hills, and this bed, which is nearly dry in the hot season, still keeps the name of Brahmaputra. In the wet season its flood-waters pour into the Meghna.

The Delta of the Ganges and Brahmaputra.—The third or delta stages of these rivers are joined together. After their meeting at Goalanda, the combined rivers flow south-eastwards, and receive the drainage of the southern slopes of the Garo, Khasi, and Jaintia Hills on the north, and of the Lushai Hills on the east. This drainage, which is brought down by the Surma and Kusiyara distributaries of the Barak, flows down the great Cachar and Sylhet valleys. The waters of the Padma (Ganges), Jamuna, Brahmaputra, and Surma then form the estuary of the Meghna, which is the great opening of the delta on the east, as the Hooghly is on the west. Thus we really have three deltas.

1. **The delta of the Ganges**, which begins where the Bhagirathi breaks off southwards from the main channel, about half-way between the Rajmahal bend and Goalundo.

2. **The delta of the Brahmaputra**, beginning a little below the Garo bend where the new bed of the Jamuna and the old bed of the Brahmaputra split off from each other.

3. **The Meghna delta**, which begins high up the Sylhet valley where the Barak splits up into the Surma and Kusiyara.

The great united delta has a sea-face of over 200 miles: it is intersected by fourteen large estuaries and hundreds of

* During the recent expedition to Tibet (1904) the upper half of the Tsanpo from Shigatse (due north of Kinchinjunga) to its source, was mapped out. (See also p. 191.)

small ones, which break it up into a labyrinth of flat mud islands, formed by the silt brought down by the Ganges. The sea, especially during the summer monsoon, rushes up these estuaries and checks the current of the river, which in consequence deposits its burden of mud. This great stretch of flat mud islands, covered with dwarf palms and brush-wood, the haunt of tigers and crocodiles, is called the **Sundarbans.** The heat and dampness breed a kind of fever, which at certain seasons makes the whole region very unhealthy.

By looking at the map we can see the enormous importance to India of the Indus-Punjab and Ganges-Brahmaputra Systems. Like two great arms the Indus and the Brahmaputra completely clasp themselves round the Himalayan Ranges so that all the rain that falls and all the snow that melts whether on their northern or southern flanks, is bound to come into India Geographically the Himalayas belong as much to Tibet as to India, but these river-systems bring all the *benefits* of these mountains to India alone.

RIVERS OF THE DECCAN TABLE-LAND.

RIVERS OF THE Bay of Bengal.

1. Flowing into the Bay of Bengal.

Drainage.—The area drained by these rivers is bounded *on the north* by the Satpuras, Vindhyas, and Chota Nagpur Highlands; *on the west* by the Western Ghats. [*See map* 19.]

Course.—The general course of these rivers is :—

(1.) A long, fairly straight run from their sources in one or other of these ranges down the eastward slope of the table-land.

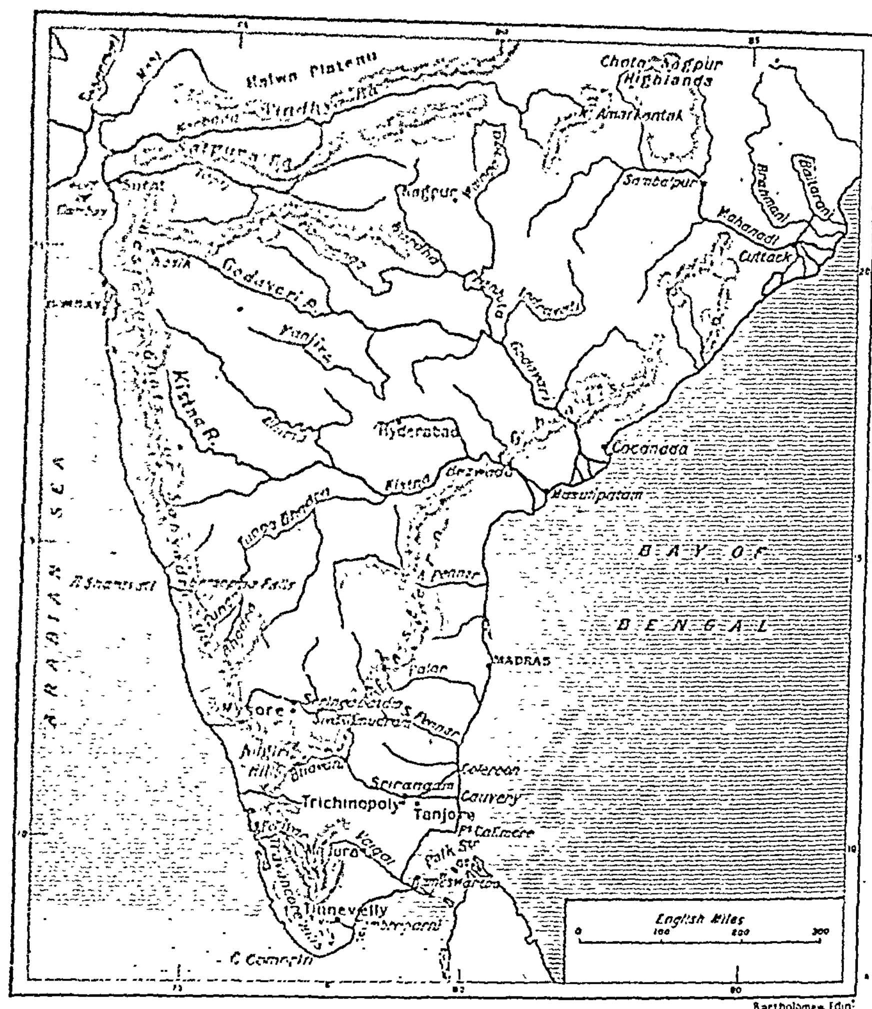
(2.) A break through the Eastern Ghats.

(3.) A short run across the flat coast-strip to the sea, ending usually in a delta.

The rivers in order from north to south are the *Mahanadi, Godavari, Kistna, North Penner, Palar. South Penner, Kaveri* (or Cauvery), *Vaigai, Tambraparni.*

The **Mahanadi** rises in the high country south of Amarkantak Range of the Satpuras, drains some of Chota Nagpur highlands, and flows eastward till it reaches through the Eastern Ghats in a great gorge, and rea

the coast-strip, where it branches off into a delta, some 200 miles south of the Hooghly. To the north, the **Baitorani** and **Brahmani** from the Chota Nagpur highlands join it at its delta.



19. THE TABLE-LAND RIVERS.

The **Godavari**, the largest river of the Deccan, rises near Nasik (only 50 miles from the Arabian Sea) in the Western Ghats. For the first two-thirds of its course it flows nearly due east right across the Deccan table-land, and then turns south-eastwards to the sea. It forces its way through the

Eastern Ghats in a deep, narrow gorge, 20 miles long, and, soon after, it enters the flat coast-strip, where it gives off the distributaries that form its delta.

Tributaries.—At the point mentioned above where the Godavari turns south-eastwards, it receives on the left bank the **Pranhita**, itself a large river, made up of the waters of the **Wainganga** from the north, the **Wardha** from the north-west, and the **Painganga**, from the west. A little below this point the **Indravati** comes into it from the north-east. On the right bank, half-way down its course, the Godavari is joined by the **Manjira** from the south.

The **Kistna** (or Krishna) rises in the Western Ghats, not far from the sea. Its general course is eastwards across the Deccan plateau, but for the first part of its course, and near the end where it crosses the coast-strip, it flows nearly southwards. Near Bezwada it breaks through the Eastern Ghats in a gorge, and then for the last 60 miles to the sea it splits up into a delta.

Tributaries.—The **Bhima** rises in the Western Ghats east of Bombay, and flows south-east to fall into the left bank of the Kistna at a point about half-way across the table-land. The **Tungabhadra** joins the Kistna a little farther down, bringing in the **Tunga** and **Bhadra** and other tributaries, the drainage of the northern slopes of the Mysore plateau, which is higher than the rest of the Deccan.

Note.—The deltas of the Godavari and Kistna touch each other.

The **North Penner** rises in Mysore, flows northwards down the northward slope, and then strikes east into the bay about 100 miles south of the Kistna.

The **Palar** also rises in the high ground of Mysore, but flows down the eastern slope, and enters the sea about 50 miles south of Madras.

The **South Penner** or **Ponnaiyar** is a shorter river flowing eastwards from the edge of the same table-land into the bay about half-way between Madras and Point Calimere.

The **Kavari** rises in Coorg among the Western Ghats, flows south-eastwards across Mysore, leaves it when it breaks through the Eastern Ghats (here far from the sea) at the Sivasamudram Falls, and then strikes due east across the plain past Trichinopoly, where its delta, formed by the Coleroon or northern, and the Kavari or southern branch, begins.

Tributaries.—Several small feeders join it in Mysore, and in

[th]e plain it is joined by the **Bhavani** from the southern slopes [o]f the Nilgiri Hills.

Note.—Kavari Islands.—In its course the Kavari forms three [i]slands famous for their sanctity—*Seringapatam*, near Mysore town; *Sivasamudram*, at the falls on the Mysore frontier; and *Srirangam*, near Trichinopoly. The first is also famous as Tippu's last stronghold in the Mysore wars.

The **Vaigai** rises in the eastern slopes of the Travancore Hills, flows past Madura town, and falls into Palk's Strait near Rameswaram.

The **Tambraparni** is a small river flowing past Tinnevelly; it is a great source of irrigation, receiving rain from both monsoons, and the centre of a very rich belt of rice cultivation.

General features of the South-eastern Rivers.—The Mahanadi, Godavari, Kistna, and Kavari flow:—

(1.) Over the rocky table-land of the Deccan. Their valleys are therefore narrow and deep, being hollows worn away by the current flowing over the hard surface. Hence, in their upper courses they are little used for irrigation. Like the Vindhyan feeders of the Ganges, they rise very rapidly when in flood. The flooded Mahanadi pours as much water into the sea as the flooded Ganges.

(2.) Through a dry country with a light rainfall. Hence they are usually shallow, and quickly dry up.

(3.) Over rocky beds and through gorges. Hence they are of little use for navigation. Even on the Godavari there is but little boat traffic.

(4.) Their deltas on the coast-strip are, however, fully irrigated. Tanjore, "the garden of Southern India," is th[e] delta of the Kavari; the deltas of the Godavari, Kistna, an[d] Mahanadi are also famous for their fertility.

(5.) The Godavari, Kistna, and Kavari, having th[eir] sources in the Western Ghats, where the summer monso[on] is heavy, are often in flood when the country through wh[ich] they flow has had no rain, and when rivers like the Penn[er] and the Palar, rising in the parched Deccan, are dried [up]. Hence, also, in their deltas rice cultivation may be goin[g on] though no rain has fallen near the coast for months.

(6.) The Deccan rivers are millions of years older [than] those of the Himalayas. They have thus been at work much longer and they have worn their valleys and bed[s] nearly level. But in the Himalayas the rivers are y[oung]

and are still cutting back their beds and actively lowering their channels.

The Periyar Project.—The Madras government have contrived a wonderful irrigation work which feeds the Vaigai. They have built an anicut across a river (the Periyar) flowing down the west side of the Western Ghats, and, by cutting a tunnel through these hills, have made the water run eastwards to irrigate a large tract of country and then flow into the Vaigai. Water which ran useless into the Arabian Sea is thus led across the peninsula into the Bay of Bengal.

2. Flowing into the Arabian Sea.

The Narbada, Tapti, Mahi, Sabarmati.

Since the Western Ghats run close to the coast, there is no room for any large river on their seaward side, though the *rainfall is heavy, and there are therefore many small ones.* Among the many short streams, the **Shiravati** is the best known, on account of the **Gersoppa** *Falls* on it, the chief of which is nearly 900 feet high. But north of the end of the Western Ghats two large rivers flow into the Gulf of Cambay.

The **Narbada**, *rising* in the Amarkantak Range of the Satpuras, flows westwards to the sea Being confined in the narrow valley between the Vindhyas on the north and the Satpuras on the south, it has no room to wander about, and its course is very *straight*; for the same reason it does not receive any large tributaries.

The **Tapti.**—Some 50 miles south of the *Narbada*, and separated from it by the Satpuras, is the Tapti. It also has a very *straight* course westwards, and near the *end* of its [illegible] the Ghats.

[illegible] ses of the Narbada and [illegible] me from rocky uplands, [illegible] then flow through narrow but fertile valleys, and at last over alluvial plains near the coast. They have no deltas, and are therefore navigable by small ships from the sea for about 60 miles up their course in flood time.

The **Sabarmati** and **Mahi** drain the western end of the Malwa plateau between the Vindhyas and the Aravallis, and flow into the northern end of the Gulf of Cambay.

THE GEOGRAPHY OF IRRIGATION.

Agriculture is, as we shall see, the kind of work by which most of the people of India earn their living, and in a hot country such as India water is especially necessary to fertilise the fields.* As rivers are the great drains by which the surplus rainfall is carried off, one of the most important questions for India is **How can man use these great drains for irrigating his fields?** Every year they carry into the sea enormous quantities of rain-water, and if this water which is now wasted could be turned on to the land no doubt the fertility of the country would be vastly increased, and famines might be no longer known.

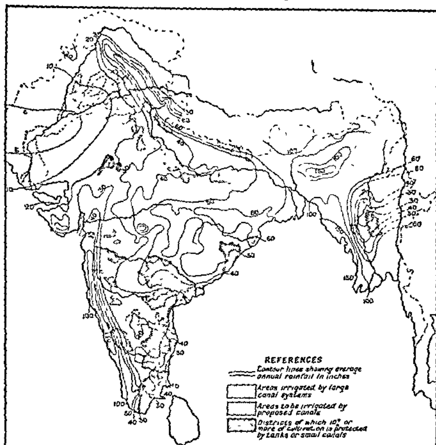
But a study of the geography of India, *i.e.* of its build and its rivers, its climate and its rainfall, soon teaches us that it is impossible to make use of more than a fraction of the water of streams and rivers for irrigation. In the first place, in those parts of India where there is a heavy rainfall, irrigation works are not required. In the second place, water cannot be made to run up-hill and thus any water from a stream can only be used for land below its level: the land above can get none of it. The water of the Indus, for example, can never be used to fertilise the dry tracts of Rajputana which lie above the level of its valley Look back to the coloured map at the beginning of this book. None of the water which flows over the green parts can be used for the parts marked yellow. In the third place, even when water might possibly be stored up, the cost of making large works would be too great. We can find illustrations of these different points in the rivers of India.

Thus in the great **Ganges Valley** which has a heavy rainfall there is but little necessity for making irrigation works. On the other hand, no engineering skill could ever catch and stop the heavy floods that roll down the river to the sea every monsoon. In the part of the Ganges above Benares there are, indeed, large canals irrigating an immense area, but even these great works use up only a fraction of the river water, and it is calculated that 85 per cent. of the surface drainage of this part flows down-stream and is lost. In the part of

* In countries with a temperate climate, such as England, the farmer drains the surface water *off* his fields.

the Ganges below Benares there is even less need for irrigation and 90 per cent. escapes.

From what has been said of the climate of the plains through which the **Indus and its feeders** flow it is easy to understand that the thirstiness of the soil, the dryness of the air, the



20. IRRIGATION MAP OF THE INDIAN EMPIRE.

heat of the sun, and the flatness of the land allow only a small proportion of the rainfall to flow into the rivers. Owing, however, to the great need for water here and the ease with which canals can be dug in the soft flat surface, a large percentage of this water is used for irrigation.

Turning now to the **rivers of the Deccan Table-land**, we know that the **Mahanadi, Brahmani, and Subanrika**

THE GEOGRAPHY OF IRRIGATION.

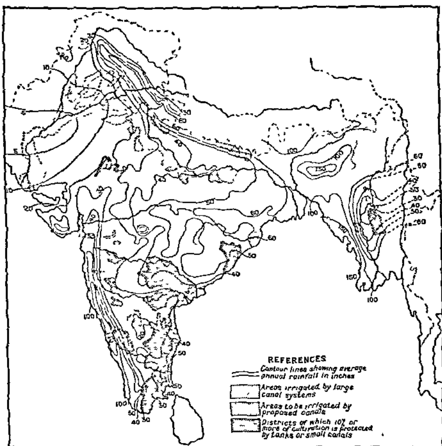
Agriculture is, as we shall see, the kind of work by which most of the people of India earn their living, and in a hot country such as India water is especially necessary to fertilise the fields.* As rivers are the great drains by which the surplus rainfall is carried off, one of the most important questions for India is **How can man use these great drains for irrigating his fields?** Every year they carry into the sea enormous quantities of rain-water, and if this water which is now wasted could be turned on to the land no doubt the fertility of the country would be vastly increased, and famines might be no longer known.

But a study of the geography of India, *i.e.* of its build and its rivers, its climate and its rainfall, soon teaches us that it is impossible to make use of more than a fraction of the water of streams and rivers for irrigation. In the first place, in those parts of India where there is a heavy rainfall, irrigation works are not required. In the second place, water cannot be made to run up-hill and thus any water from a stream can only be used for land below its level: the land above can get none of it. The water of the Indus, for example, can never be used to fertilise the dry tracts of Rajputana which lie above the level of its valley Look back to the coloured map at the beginning of this book. None of the water which flows over the green parts can be used for the parts marked yellow. In the third place, even when water might possibly be stored up, the cost of making large works would be too great. We can find illustrations of these different points in the rivers of India.

Thus in the great **Ganges Valley** which has a heavy rainfall there is but little necessity for making irrigation works. On the other hand, no engineering skill could ever catch and stop the heavy floods that roll down the river to the sea every monsoon. In the part of the Ganges above Benares there are, indeed, large canals irrigating an immense area, but even these great works use up only a fraction of the river water, and it is calculated that 85 per cent. of the surface drainage of this part flows down-stream and is lost. In the part of

* In countries with a temperate climate, such as England, the farmer drains the surface water *off* his fields.

the Ganges below Benares there is even less need for irrigation and 90 per cent. escapes. [illegible] the plains through [illegible] easy to understand [illegible]ess of the air, the



20. IRRIGATION MAP OF THE INDIAN EMPIRE.

heat of the sun, and the flatness of the land allow only a small proportion of the rainfall to flow into the rivers. Owing, however, to the great need for water here and the ease with which canals can be dug in the soft flat surface, a large percentage of this water is used for irrigation.

Turning now to the **rivers of the Deccan Table-land**, we know that the **Mahanadi, Brahmani, and Subanrika**

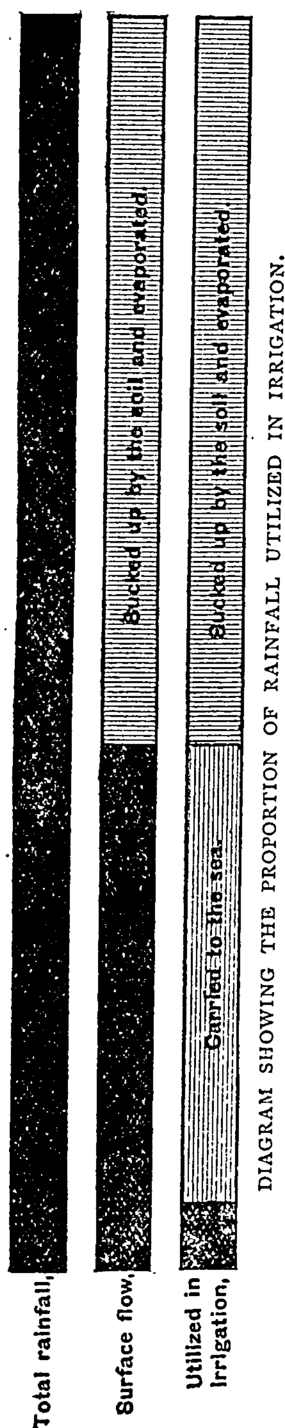


DIAGRAM SHOWING THE PROPORTION OF RAINFALL UTILIZED IN IRRIGATION.

flow through a part of India where the rainfall of the summer monsoon is heavy. Therefore irrigation works are there not required, so that nearly all the river water flows into the Bay of Bengal unused. Only about 12 per cent. of the water brought down by the **Godavari and Kistna** is used in irrigation—chiefly of course in their flat deltas. The country through which these two rivers flow has, as we saw, on the whole, only a moderate rainfall, and therefore it is here that most good can be done in the future by making large new irrigation works. The Governments of Bombay, of Madras, and of the Mysore State have each formed schemes to improve agriculture in this way. The plan of the Madras Government is to build an anicut across the Tungabhadra which would form the largest tank in the world.

It is on the **Palar, Kavari,** and **South Penner,** or Ponnaiyar, that the largest percentage of river water is used for irrigating the fields. This is because tanks can here be very easily made, and because on the flat Kavari delta canals are easily dug. In most years almost all the water of the Palar is used up in this way and very little escapes to the sea.

Again, **on the west coast,** an enormous volume of water is poured into the sea down the steep seaward face of the Western Ghats during the south-west monsoon. It is calculated that about one-sixth of the total surface flow of India is lost on this slope alone. But little or nothing can be done to save this water. In the first place it is not required locally, because the narrow coast-strip below has a heavy rainfall

of its own. In the second place, to catch water on steep slopes like the Ghats to be used on the Deccan, enormous and very expensive stone dams like the Periyar dam must be built, and it does not pay to make them.*

India possesses more irrigation works than any other country in the world, but the diagram given above shows what a tiny portion of the rain and river-water flowing over the surface of the land man, with all his anicuts and tanks and canals, has been able to make use of to irrigate his fields.

* Quite recently, however, a great scheme has been set on foot by the [illegible] rainfall [illegible] are here being [illegible] [illegible] the water [illegible]

By this scheme an immense volume of water (equal, it is said, to the whole summer flow of the river Thames), which now runs useless to the sea, will be made to do a vast deal of useful work.

NATURAL PRODUCTIONS.

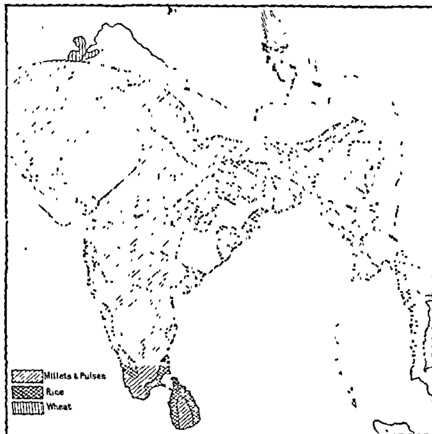
From the climate and rainfall and rivers of India we can understand what are the chief productions of its fields and forests. It is a hot country, and produces almost all the crops and trees of the Torrid Zone, as well as, in its northern and its elevated districts, some of those of the Temperate Zone. In India there is always plenty of heat and sunshine, and the fertility of a district depends on its soil and rainfall. We can divide the productions into—(1.) those which are used for food; (2.) those used for other purposes.

CROPS USED FOR FOOD.

1. **Cereals.**—(*a.*) **Paddy** is the grain from which the rice of commerce is obtained by removing the husk. This is the chief crop of India, but it is not the chief food. The people eat more of other cereals and of pulses than they do of rice. Only about one-third of the people are rice-eaters. Paddy requires heat and is grown in fields which can be flooded at certain stages of its growth, hence it is *chiefly grown* (1.) in the great, flat, well-watered plains of Bengal where there are usually two crops, in the Surma and Brahmaputra valleys, and in the Mahanadi delta; (2.) in Burma which, as we shall see, receives a heavy monsoon and has fine paddy lands in the Irrawaddy valley and delta; (3.) in the Madras Presidency, which has the finely-watered deltas of the Godavari, Kistna, and Kavari, many tanks on the east coast, and a very heavy rainfall on the Malabar coast seaward of the Western Ghats; (4.) in the United Provinces which are watered by the Upper Ganges tributaries, and by many canals. The Punjab and Sind are too dry *to grow* much paddy, except in irrigated tracts. Bengal and Bihar produce more than half the rice grown in India and Burma together.

(*b.*) **Wheat.**—Wheat can *sprout even* under snow, but cannot stand moist heat. It grows best in clayey alluvial

soil, and, when sprouting, prefers a cold climate which makes it send out branches underground. But, once above ground, it likes warmth and dryness. Hence it is very little grown, on hot damp plains, and, therefore, but little in Bengal and scarcely at all south of the Godavari. It thrives in the



21. DISTRIBUTION OF THE CHIEF CEREALS AND PULSES.

cold season on the clayey alluvial soils of the United Provinces, the Punjab, and Sind, and in the better soils of the Central Provinces. The elevated tracts of the Shan States, in the east of Burma, promise to become a wheat-growing area.

(*c*.) Barley is not so deep-rooted as wheat and so cannot stand dry weather so well. It is not much grown in India, and most of it comes from the United Provinces and the

gh grounds of the Bengals where there is a good cold eather season.

(ii.) **Millets.**—**Sorghum**, **Jowar** or **Cholam**, prefers a heavy oil and can withstand great drought: hence it is largely and widely grown, and is the common food of the people throughout the dry, black cotton soil districts. **Bulrush millet**, **Bajra**, or **Kambu** prefers a lighter soil, and, according to the variety or rainfall, is grown either as a dry crop or under irrigation from wells. On the light alluvial soils of Southern India it forms the principal food of the people.

Finger millet or **Ragi** cannot stand drought so well as the other millets and is often grown with irrigation either from tanks or wells. It is thus a dearer crop to grow and is considered rather a luxury by the poorer people.

(c.) **Maize** or **Makka.**—This is largely grown in the north of India as a food grain.

There are many other grain crops, especially varieties of millet, which are used by the people in different parts.

India eats all her own millets: she can spare none for export.

2. **Pulses.**—These are all dry-land crops which are usually sown mixed with dry-land cereals. They are of great value to India (1.) because they take nitrogen from the air, fix it in the soil, and so fertilise it: (2.) because they contain something which takes the place of animal food which is very little eaten by Hindus or by the poorer classes of other religions. The chief varieties of pulses are red gram, Bengal gram (grown of course on the Gangetic plain), the cow-pea, black gram, green gram, and horse gram.

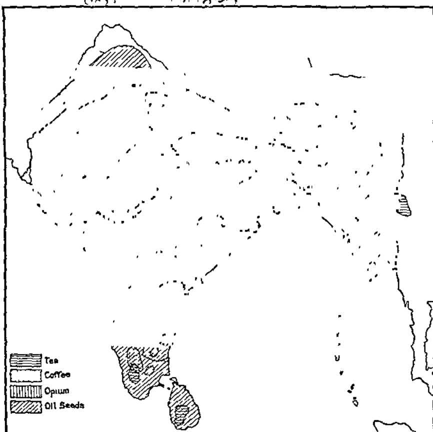
3. **Vegetables.**—The most commonly grown are the various pumpkins, gourds, cucumbers, water-melons, bringals, cow-peas, sweet potatoes, and yams.

4. **Fruits.**—India has many kinds of fruit. Mangoes, plantains or bananas, pine-apples, guavas, pomegranate jack-fruits, custard-apples, papaws, figs, melons, oranges, ar limes, as well as cocoa-nuts, are the most common; but they have not been so carefully cultivated as the fruits Europe, they are not so luscious. In Kashmir, on acco of its more temperate climate, many kinds of European f trees thrive.

5. **Sugar.**—This is made from sugar-cane and from palmyra and bastard date palm. Sugar-cane requires

soil and irrigation. It is therefore grown chiefly in the United Provinces, Bengal, and the Punjab. India does not grow enough sugar for her own use and imports large quantities.

6. **Spices.**—The people of India use spices largely for curries. Turmeric and chillies are grown almost everywhere.



22. DISTRIBUTION OF TEA, COFFEE, OPIUM, AND OIL-SEEDS.

Cardamoms, pepper (the fruit of a creeper), and ginger are

coasts

the north of India and up to 5,000 feet

best crops are got where there are frequent showers of rain

to bring out the fresh leaf-buds, from which the finest tea is made. Assam, which receives rain nearly all the year round, has therefore the best climate for tea, and produces about three-fourths of all the tea grown in India. Tea also grows on the Himalayas, in Darjeeling, the Kangra district of the Punjab, the Dehra Dun districts of the United Provinces, and the Nilgiri and Travancore Hills in Madras. Thirty years ago the people of Great Britain drank China tea; they now drink tea from India and Ceylon.

8. **Coffee.**—This is the dried berry of a shrub, and is said to have been introduced into India more than two hundred years ago by a pilgrim returning from Mecca in Arabia. The shrub grows best on hills about 3,000 feet above sea-level, and in a damp, warm climate. It cannot stand the full force of the monsoon rains; it is therefore grown on the side of hills sloping away from the monsoon—that is, on the landward side of the Western Ghats in Mysore, Coorg, Travancore, Cochin, and the Nilgiris. Very little coffee is drunk in India. Half the total crop of India is grown in Mysore.

CROPS USED FOR OTHER PURPOSES.

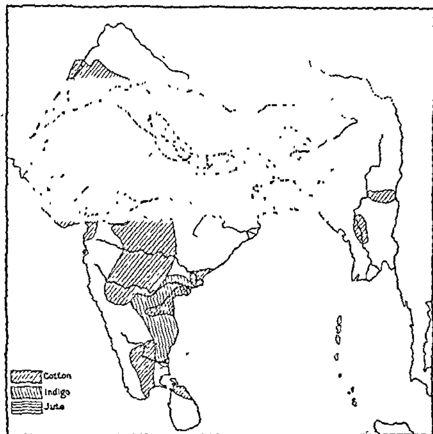
1. **Fibres.**—(*a.*) **Cotton**, the soft fibre in the husk that covers the seed of the cotton plant, prefers a warm climate, and the Indian cottons flourish best in the soft loam called black cotton soil or *regar*. This soil is chiefly found in the Gujarat and Kathiawar plains of Bombay, in the valleys of the Central Provinces, in Berar, in the "ceded districts," and in the Coimbatore and Tinnevelly districts of Madras. The "staple" or fibre of Indian cottons is not so long nor so fine as that of American cotton.

(*b.*) **Jute** is the fibre of a plant which grows in damp soil. It takes a great deal of nourishment out of the ground, and so can be best grown where the soil is constantly renewed by alluvial mud. Once well above ground, it does not object to floods. Hence it is chiefly grown in the lower valleys of the Ganges and Brahmaputra. A very little is also grown in Assam.*

* The plant known as Bombay, Madras, or Bimlipatam jute, and grown largely in the dry areas of Bombay and the northern districts of Madras, is not real jute at all.

(c.) **Sunn hemp or Bombay hemp**, a tall plant with a yellow flower, yields an excellent fibre. A bag made of this hemp sells for six times the price of an ordinary jute gunny bag.

2. **Oil Seeds.**—There are six chief kinds of these seeds: linseed, rape, cotton seed, sesamum (gingelly), castor seed,



23. DISTRIBUTION OF FIBRES AND INDIGO.

and ground-nuts. They are grown generally over the whole of India, and in very fertile parts are sown as a second crop. The oil squeezed out of them is used for food, oil-baths, and for lamps. A great quantity is exported to Europe as food for cattle, and for making sweetmeats and soap. The refined oil of the castor seed is used as medicine.

3. **Indigo** is the sediment which is deposited from the

go plant when steeped and beaten. It is used as a dye. is grown chiefly in the Ganges valley round Patna, and the United Provinces, Madras, and the Punjab. It is w grown to a less extent than formerly, as the Germans ave found out a cheaper method of making artificial indigo ut of chemicals.

4. **Opium** is the dried juice which oozes out of the capsules of the poppy plant. It is a very powerful drug, and is poisonous unless taken in very small quantities. It is eaten as a stimulant by people in India, is smoked and eaten by the Chinese, drunk as a kind of tea by the Sikhs, and used as a medicine by the rest of the world. In British India the Government keeps the cultivation of the poppy under its own control. It is grown (1.) in Bihar round Patna; (2.) in the United Provinces round Benares, and Ghazipur (this is called *Bengal opium*); (3.) it is also grown in the native states of the Central Provinces, Rajputana, and the Gaekwar of Baroda's dominions. This opium is called *Malwa opium*. The Government of India sells the opium to Calcutta merchants, who export it to China.

5. **Tobacco** is the dried leaf of a plant which was first introduced into India by the Portuguese three hundred years ago. It is grown in almost every district for local use. The chief tobacco-growing districts are Bengal, the United Provinces, Madras (chiefly in the *lankas* or islands of the Godavari), and Burma.

6. **Cinchona** is the prepared bark of a tree, introduced from Peru in 1860. Its original home is on the Andes, high mountains in South America, where there is plenty of rain, heat, and sunshine. It therefore flourishes best on similar situations in India, chiefly in the Nilgiris, Mysore, Travancore, and at Darjeeling. From the bark is prepared quinine, the great preventive of fever.

7. **Silk** is a kind of gossamer thread spun by a grub called the silkworm. The silkworm thrives best on the leaf of th mulberry shrub, and it is only where this shrub grows we that silkworms are kept. This is chiefly in Bengal. The are also "*wild silks*" obtained from other worms grov on jungle trees. These silks are called *tasar* or *tusser* si Assam is famous for it, and there every one dresses in on holidays.

8. **Lac** is a kind of yellow gum secreted on the branche

trees by an insect. From it are obtained (1.) a dye; (2.) a kind of wax called shellac, which is used as varnish. Lac is gathered by wild tribes in Chota Nagpur and Assam.

FORESTS.

The chief forest districts are in the rainy parts of the Western Ghats, the Himalayas, Assam, and the hills of Burma. The Sundarbans of the Ganges delta are covered with jungle, which supplies Calcutta with firewood In most parts of India, except the dry area, if land is left to itself it quickly gets covered with a scrubby jungle.

India, on account of the variety of its climate, produces many kinds of trees.

The **Teak**.—This is "the king of Indian forest trees," and flourishes best where there is a heavy rainfall. It is therefore found in the Western Ghats, Assam, and Burma. The Himalayas are too cold for it. It is a splendid timber tree, very hard, does not rust nails driven into it, and the white ant leaves it alone. It is floated down the rivers to the coast, but it will not float in water till it has been dead two years.

The **Sal** is next to the teak as a timber tree, but can flourish with less rain. It grows chiefly in the Eastern Himalayas, on the hills of Central India, and on the Western Ghats.

The **Deodar**, a kind of cedar, also a good timber tree, grows in the Himalayas.

Pines, which also give good timber, prefer a temperate climate, and are therefore found on the Himalayas. They have also been planted on the Nilgiris.

Besides these timber trees, there are many others useful in other ways. The **Sandal-wood** tree grows in Mysore, the **Ebony** on the Western Ghats, and the most useful **Bamboo** all over the peninsula and Burma.

Timber in India, as in other countries, is too bulky to transport except by means of rivers. Hence we find that while the forests of the Himalayas, of Assam, and Burma, with their fine waterways, have been largely cut down, the forest lands of the Deccan are of little value except locally, [illegible]

The *cocoa-nut* prefers
climate with good
ip of coast all round

south of the peninsula. It yields a nut, the kernel of ich, when dried, is called *copra*, from which oil is squeezed. e tree also yields fibre (*coir*) for ropes and matting. Its aves form the roofs of houses. The palmyra and bastard ate yield sugar and toddy: they grow all over the peninsula. The true date, yielding the date fruit, loves a dry climate, nd therefore flourishes in Sind. The areca palm, which yields "betel-nut," is chiefly grown in the deltas of Bengal and the west coast.

ANIMALS.

In India and Burma there are many kinds of animals belonging to the tropical and subtropical regions of the earth. The larger wild animals abound in those parts where they are least disturbed by man—namely, in the valleys of the Himalayas (especially in the Tarai) extending from Kashmir to the Brahmaputra valley, in Upper Burma, on the Eastern and Western Ghats, and in the jungles of the Central Provinces and Central India.

Wild Animals.—(1.) *Flesh-eaters*. The *lion* of India, now nearly extinct, is found in Gujarat; *tigers* are found in hilly and jungly parts all over India, where they are undisturbed and can find food; *leopards* or *panthers* are common in the hills and plains, and a kind of leopard called the *cheetah* is taught, in some places, to hunt; *hyænas*, *foxes*, *wolves*, *jackals*, and *wild cats* are to be found everywhere; the *wild dog* lives on the Nilgiri Hills.

(2.) *Non-flesh-eaters*. The *elephant* is found in herds in the lower Himalayan valleys, in the Brahmaputra valley, in Upper rma, and in the Travancore and Mysore ranges of the estern Ghats. *Bison* and *wild buffaloes* are hunted on the lls of Southern India, *bears* on the hills nearly everywhere eer and *antelopes* on the plains. The *ibex*, a rare kind c oat, is found on the tops of the Nilgiris and the Wester Ghats, and on the mountains of Kashmir; *yaks* are peculi to the higher Himalayas; *wild asses* are found in Cutch a Sind; the *rhinoceros* frequents the swamps of Assam, Burr and Northern Bengal; *monkeys*, *porcupines*, *hares*, *wild l* are to be seen in nearly every district.

Domestic Animals.—*Cattle* of different breeds, *goats*, *sh* *horses*, *ponies*, *asses*, and *mules* are kept, but for agricul

purposes the *bullock* and the *tame buffalo* are chiefly used. The Himalayan *yak* has been broken to carry goods over the mountains. The desert districts of Rajputana and Sind are famous for their breed of *camels*, and Kathiawar for its peculiar breed of horses; but India imports its best horse-flesh from Arabia and Australia. The *Burman pony* is well known for its endurance. Government breeds *mules* for military transport purposes. In Burma the *elephant* is taught to drag and pile huge teak logs.

Birds.—The chief birds of prey are the common *vultures*, *kites*, and *hawks*. Game-birds are *wild ducks*, *florican* or bustard of India, *wild geese*, *partridges*, *quails*, *pigeons*, the *sand-grouse* of Rajputana, and the *jungle fowl* (from which the domestic fowl is said to have been bred). In the cold season millions of *snipe* migrate to the paddy fields of India and Burma. Of other birds, *parrots*, *peacocks*, *mainas*, *cranes*, *crows*, and a multitude of smaller kinds are very common. Birds in India, as in most hot countries, are more famous for their plumage than for their song.

Reptiles.—In India and Burma many kinds of reptiles abound. Of *crocodiles* there are two kinds—the common *maggar* or blunt-snouted, and the *gavial* or long-snouted (found in the rivers of Northern India). *Cobras*, *Russell's vipers*, *karaits*, and the *hamadryads* of the hills are the most deadly kinds of snakes; the huge *python* is not poisonous, but kills its victim by crushing it in its enormous coils.

Fish of various kinds abound in the tanks and rivers. As the sea round the coasts is very shallow and has a sandy bottom, it is a splendid breeding place for fish.

EFFECT OF CLIMATE AND PHYSICAL FEATURES UPON THE PEOPLE.

We have now to consider how the peoples of India have been and are affected by the physical features of the country, —the rainfall, mountains, rivers, sea, and climate.

INFLUENCE OF RAINFALL.

Density and Distribution of Population.—The population in India, as in every agricultural* country, is thickest where the soil is most fertile, and fertility in India depends on rainfall. Hence, as a rule, *the density of the population varies with the amount of the rainfall*. But there are some other things to be taken into account.

Even though the rainfall is heavy, the population may not be dense.

(1.) If the rainfall is uncertain.

(2.) If the country is mountainous, or forest-covered, and therefore little productive.

(3.) If it is unhealthy.

(4.) If it is open to the attacks of enemies.

On the other hand, the population may be dense, even though the rainfall is only moderate.

(1.) If there is a good system of irrigation to make up fo the light rainfall.

(2.) If the rainfall, though light, is certain.

Taking now our four divisions of rainfall (see pp. 45– we can examine how they compare with each other in rega to density of population.

1. **Indo-Gangetic Plain from the Surma to Jhelum.**—This well-watered area is also thickly populat it is the most thickly populated part of India.

* In *manufacturing* countries such as England the populat thickest in the coal-mining and iron-mining districts.

But the Brahmaputra valley is an *exception*: *it is very thinly populated* because (1) it contains many mountains and jungles; (2.) the lower hills are unhealthy; (3.) a hundred years ago it was overrun by the Burmese, who left it almost without inhabitants.

The southern part of the upper Indo-Gangetic Plain (from Allahabad to the Jhelum) gets little rain, but the population *is dense on account* of the number of canals and other irrigation channels (supplied by snow-fed rivers independent of the monsoon), which make up for the light rainfall.

2. **Coast-strips.**—(1) West coast from the Tapti to Cape Comorin. The heavy rainfall never fails; three crops of rice are reaped, and so the population is dense (2.) **East coast** from the Ganges delta to Cape Comorin Although this strip only gets half the rainfall of the west coast, the population is fairly dense because (*a*) little of the country is taken up by hills; (*b*) it contains the four finely irrigated deltas of the Mahanadi, Godavari, Kistna, and Kavari, and thousands of tanks and wells

3 **The Table-land Region of the Deccan and Central India.**—The whole of this region is thinly populated. The north-east corner, including the Central Provinces and Chota Nagpur, though it receives a large and certain rainfall, is covered with hilly, poorly cultivated jungles, and, in consequence, its population is thin

4. **Dry Area.**—This is the most thinly populated part of India. Baluchistan, for example, has only eleven persons to *the square mile*, and the rest of the area would be as thinly peopled were it not for the patches of land irrigated from the Indus flood canals.

Thus, on the whole, as our map shows, *the order of the regions in regard to rainfall is the same as their order in regard to population, the exceptions being* (1) the Brahmaputra valley and the north-east corner of the Deccan which, though well watered, are thinly populated, (2) the southern part of the upper Indo-Gangetic valley, which, though it receives a small rainfall, is densely populated on account of its splendid system of irrigation.

We shall see that Burma is another exception to the [illegible] Though a very wet country, its population is very sparse

THE GEOGRAPHY OF FAMINE.

In the same way we can understand what parts of India are most likely to suffer from famine, and what parts are safe from it.

Famine occurs in places where the rainfall is usually moderate and where a large number of people are dependent for food on rain, and the rains fail. In districts where there is usually very little rain we do not find famine occurring. For example, in Sind and the dry area, only about five inches of rain falls in the year, but there is never famine in Sind, for the people do not expect more, and do not depend on it. Again in the parts of the Punjab lying in the doabs of the Five Rivers the rainfall is moderate and very variable from year to year, but in modern days this large area is safe from famine owing to the splendid net-work of canals which water the country from the snows of the Himalayas. Here the people do not depend on the rainfall. The deltas of the Deccan rivers on the east coast and the upper Ganges plain are protected, in the same way, by irrigation works on these rivers.

Once more, on the west coast strip, in the Lower Ganges and the Assam valleys (and in Burma), where the rainfall is always very heavy, it makes no difference to the crops if there is a shortage of 20 or 30 inches, because there is still plenty of rain to fertilize the ground.

But where the rainfall is usually moderate—under 30 inches —*there* a shortage of 20 inches means that the crops cannot be grown and there is no food to eat. Therefore, we can understand that almost all the Table-land Region, which (except in the north-east corner) receives only moderate rain, is liable to drought and famine. It is in this region of India that famine has most often occurred.

INFLUENCE OF MOUNTAINS.

1. As Barriers.—(1.) The Himalayas have been called "the human equator of the earth." They have always cut off India from the rest of Asia. Even at the present day there is scarcely any trade or communication of any kind between India and Tibet or China. The number of the people who are tinged with Tibetan or Mongolian blood is

aluchistan are as rugged as the mountains among which hey live.

4. It is found that people who dwell in mountains are also, as a rule, divided up into small clans separated from one another in language and customs. Thus in the Chin Hills in Burma the people of one village have no traffic with and do not even understand the language of the next. If we look at a detailed language-map of India, we find that, in proportion to their area and population the mountainous parts contain far more separate languages than the plains.

INFLUENCE OF RIVERS.

In warm countries the earliest civilisation sprang up on the banks of rivers because food was there most easily obtained.

Rivers, if large enough to be navigable, afford an easy means of communication between one part of the country and another. As we have seen, the Ganges, Brahmaputra, and their tributaries are the most important navigable streams, being full of water nearly all the year round. This is one of the reasons why the Gangetic valley has, since the earliest times, been the centre of trade and civilisation. When the rest of India was pathless forest, Bengal was intersected in all directions by waterways. There is not a river in the world which has influenced mankind or helped the growth of civilisation to such an extent as the Ganges. No wonder, therefore, it is a holy stream. In the same way, the Irrawaddy is the great highway of Burma

It is a disadvantage to India that her rivers usually enter the sea in shallow, sandy delta-mouths, instead of broad and deep estuaries, which, in other countries, offer a pathway for ships and commerce far into the interior. The Hooghly, the only considerable estuary in India, has to be constantly dredged to prevent it silting up. The Indus is long enough to go round the island which makes up England and Scotland but in this island there are at least half-a-dozen rivers which are more useful for navigation than the Indus.

INFLUENCE OF PLAINS.

The Plains of India have had an important influence her history. The invaders from the bleak uplands of A

kind of work which least of all leads to invention and enterprise. To-day, if we go into an Indian ryot's house or fields, we find him using just the same implements, and in the same way, as his ancestors did hundreds of years ago. Thus the warm climate and fertile soil of India, which afford an easy livelihood, partly explain why it has not advanced so fast as other countries.

Lastly, the great mass of the peoples of India are dependent every season on the monsoon rains. If these fail, no exertion on their part can prevent the crops from withering and themselves from perishing of hunger and famine. This utter dependence on Nature is one reason why the people so easily resign themselves to fate. Where the people of other countries would struggle against their misfortunes, the inhabitants of India are apt to fold their hands and think it is the will of the gods that they should die.

In different parts of India the different climates have different effects. Thus, in the dry air of the north-west where man has to struggle against nature for a supply of food the people are strong and hardy. In the steamy fertile rice plains of the Gangetic delta the people are not so strong, tall, or energetic. They are, however, more keen witted and better educated.

men and merchants with their families who could supply the place with food and the palace of the chief with articles of luxury. "The rapid growth of these towns was due to the wealth of the surrounding districts being drawn into these permanent camps—and attracting to them artisans and merchants—whose principal trade in those days was in arms, ornaments, cloths, and other articles of luxury—who now form the bulk of the population." Delhi, for example, in the days of the Moghals, was known as "the camp" of the emperor, and when he moved northwards in the hot season three-fourths of the population moved with him.

Examples.—*Ancient Hindu:* Pataliputra (Patna), Madura, Trichinopoly, Kanauj, Ajodhya, Vijayanagar; the last three are in ruins or deserted. In Rajputana the capitals of the states are the places to which the early Rajput chiefs retreated from the violence of the Afghans. *Mohammedan:* (chiefly in the north) Delhi, Agra, Lucknow, Murshidabad, Allahabad: (or independent capitals in the Deccan) Hyderabad, Ahmadabad, Bijapur. *Maratha:* Poona, Nagpur, Baroda. *In Burma* there are many ancient capitals now in ruins or deserted. Pagan, Ava, and Sagaing are examples

As a rule if these old capitals have, in modern times, no modern industries to support them, their population decreases.

2. **Sacred places** which attracted priests, pilgrims, beggars, residents, and merchants.

Examples.—Benares (Kasi), Madura, Trichinopoly, Allahabad (Prayag), Amritsar, Puri, Gaya, Nasik The wealth of Benares depends on the constant influx of rich pilgrims from every part of India. Hindu princes of distant states take a pride in keeping "town-houses" in holy Kasi Puri is a city of lodging-houses for pilgrims. Rangoon was originally a village built round the sacred Shwe-Dagon pagoda.

3. **Centres of Trade and Commerce**.—Places where there are markets for the exchange of goods often grow into towns. In India many towns and villages owe their importance to *fairs* held there.

(*a*.) A place where many roads meet or where roads from mountains enter a valley is a natural site for a town, *e.g.* Srinagar in the Kashmir valley.

(*b*) A town often grows up at the confluence of two or more rivers, *e.g.* Patna and Allahabad; or, at an important point on a river, *e.g* Monghyr on the Ganges, Hyderabad (in

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DISTRIBUTION OF POPULATION.

1. India is a country of villages. Nine people out of ten in India live in country villages, and only one out of ten lives in a town or a city.* There are two main reasons for this: (1.) India is almost entirely an agricultural country, two-thirds of the people being dependent for their livelihood on the cultivation of the soil; (2.) India has few mineral resources, and few great industries (such as there are in Great Britain, Germany, France, or America) situated in towns and employing a large number of hands.

2. The towns and cities of India are almost all old; some of them are very old. In the United States of America almost all, and in England very many, of the towns have sprung into importance as centres of trade and commerce within the last hundred years. In India this is not so.† Rangoon (in Burma), Howrah, and Karachi are three exceptions.

Origins of Towns and Cities in India.—The towns and cities of India were:—

1. **Ancient** (Hindu, Mohammedan, or Maratha) **Capitals**, usually built round a fort or camp. The chiefs in former troubled times gathered together their forces in some suitable place, built a wall round it, and brought in a crowd of work-

* A "town" in India means a collection of houses inhabited by not less than 5,000 people. A "city" is a town with over a lakh (100,000) of inhabitants.

† But we must remember that town life in Europe and America is much more organised than in India. The citizens there take much greater interest in municipal work, and provide themselves with many conveniences, such as drainage, waterworks, tramways, electric light, paved streets, and market-places, which only a few Indian towns possess. Owing to the greater wealth of the people of Great Britain and America, and the colder climate, the houses that make up their towns are much better built than those in Indian towns. Thus Edinburgh, in Scotland, has only about half the number of inhabitants of Madras, but it is larger and much more important in every way.

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Sind) at the head of the Indus delta, Sambalpur at the limit of boat traffic on the Mahanadi, Henzada at the head of the Irrawaddy delta.

(c.) An important point on a trade route may favour the growth of a town: *e.g.* Multan, Peshawar, and Shikarpur are points where trade routes start from India to Baluchistan, Afghanistan, and Persia. Dera Ismail Khan and Attock are at places where bridges cross the Indus. Leh, Simla, Naini Tal, and Darjeeling are the keys to passes over the Himalayas into the Table-land of Tibet. Sadiya, a frontier station far up the Assam valley, may some day become very important because here the Brahmaputra is joined by the Dibang and the Lohit, and these three rivers may become great trade routes into Tibet. Bhamo in the north of Burma is the point where the trade route from China strikes the great waterway of the Irrawaddy. Tuticorin is, owing to its position, the port for the trade with Ceylon.

It is interesting to note that whereas in Europe and North America commerce lies at the root of the growth of most towns, in ancient India it was not so.

In Modern Times: 1. European nations obtained **sites for "factories,"** always on the seacoast at first, and a population of merchants and artisans gradually grew up round them. Examples: the *Portuguese* obtained Daman, Goa, and Cochin on the west coast, and Hooghly in Bengal; the *Dutch*, Chinsura on the Hooghly; the *French*, Masulipatam and Pondicherry on the east coast: the *English*, Madras and Balasor on the east, and Surat on the west coast.

2. As British supremacy was established, **centres of government** were selected in the different provinces (often, of course, the old capitals were chosen), and these modern political centres have grown into towns and cities. Bombay, Calcutta, Madras, and Lahore are examples.

The British have also founded many hill stations to which they and their families can retreat in the hot weather.

3. In former times, when ships were small, towns such as Calicut and Surat on the west coast were important ports: nowadays, when trade between India and the rest of the world has grown up, and the big steamers require **deep harbours**, only certain ports such as Bombay, Calcutta, Rangoon, Karachi, and Madras are deep enough to take them in.

The importance of a seaport also depends on the extent and fertility of the country lying behind it. Calcutta is the natural outlet by rail and river of the fertile Ganges and Brahmaputra deltas, plains, and valleys. Bombay, after railways were built across the Western Ghats, became the outlet for the produce of the Deccan and Upper Gangetic plain. Karachi, in the same way, since the Indus Valley Railway was made, has become the outlet for the Indus valley, the Punjab, and the Frontier trade. Rangoon is the gateway of the traffic to and from the Irrawaddy delta and valley. Madras is not so important as these seaports partly because it has not a first-class harbour, and partly because it has not a large and fertile tract of country behind it. Chittagong, since being connected by rail with the Upper Brahmaputra valley, is becoming more and more the port of Assam.

4. Since railways were made, the towns at their **junctions**, or at their **termini**, have increased in size and population. Thus, Delhi, Agra, Cawnpore, Ahmadabad, and Nagpur, which were decaying, have received a new lease of life, and are again growing rapidly.

5. The British have also established **military stations**, where troops are stationed (and bazaars grow up round them) for the preservation of order in the country, and for its protection against enemies. Examples. Secunderabad, Bangalore, Meerut, Rawal Pindi, Peshawar, and Quetta

Note.—In judging of the geographical importance of a town we must not think merely of its size and population. This is true of every country, but especially of India where many towns are merely large overgrown collections of houses. We must consider whether the town is growing, decaying, or standing still, whether it is a great centre of manufactures, of trade, or of education. Thus Hyderabad (Deccan) with over 5 lakhs of inhabitants is not nearly so important as Rangoon with only 2¾. Cawnpore with less than 2 is far more important than Lucknow with over 2½ Karachi with only 151 000 is a more flourishing city than Agra with 185,000, Poona with 158,000, Amritsar with 152,000, or Ahmadabad with 215,000.

We can even tell from the climate and soil of different parts of India and Burma what kind of buildings will be used there. Thus where the soil is alluvial we find houses built of

mud, clay, or brick; in the north of India there are many fine buildings—*e.g.* in Agra, Delhi, and Jaipur—because of the good supply of sandstone near at hand, in the Vindhya Mountains, and of marble in Rajputana. The Deccan of India is made up of hard granite-like rocks, and so there we find many fine stone temples and forts. In Burma, where teak grows plentifully, the houses and monasteries are all built of that wood. Srinagar, in Kashmir, is built of cedar wood, which grows on the Himalayas. All over India, especially in the south, bamboos and palms are largely used by poor people. As a rule, where the climate is cold in winter, or where the rainfall is heavy, the houses are better built than in places where the heat is great and the rainfall small, and less protection from the weather is required. Thus on the Travancore and Malabar coasts of India the houses are larger and better built than on the east coast. There are several reasons for this. First, the land is more fertile, and so the people are better off and can afford better houses; second, there is plenty of easily wrought building stone (laterite), and clay to make tiles; third, owing to the heavy rains of the monsoon, mud houses are of no use and stronger materials are needed.

GOVERNMENT OF THE INDIAN EMPIRE.

The Empire of India is governed by and in the name of the King of Great Britain and Ireland, who is also Emperor of India. The Emperor's authority over India is exercised in Great Britain by the Secretary of State for India and his Council, and in India by the Governor-General and his Council, of whom one at least is an Indian.

1. The Secretary of State for India and his Council (twelve in number, most of whom have spent at least ten years in India) carry on the business connected with the government of India in Great Britain. The Secretary of State can give orders to any officer in India, including the Governor-General.

2. The Governor-General (who is also the Viceroy or representative of the Emperor) and his Council of seven members constitute the Government of India. These members preside over the departments of Finance, Commerce, Home Affairs, Revenue and Agriculture, Army, Military Supply, Legislation, and Public Works. The Foreign Department (correspondence with native states and with the Secretary of State in Great Britain) is in charge of the Viceroy.

But the supreme authority of the Governor-General in Council is not everywhere in the Empire exercised in the same way. Madras, Bombay, and Bengal have Governors appointed by the Crown, and Councils to help them. The new province of Bihar and Orissa, the United Provinces, the Punjab, and Burma are under Lieutenant-Governors; the Central Provinces are under a Chief Commissioner with powers nearly equal to a Lieutenant-Governor's. Over Assam, Coorg, Ajmer-Merwara, British Baluchistan, the North-West Frontier Province, and the Andamans are Chief Commissioners with fewer powers than those of the Central Provinces.

Legislation.—Laws for the Indian Empire are passed (1.) by the Imperial Parliament; (2.) by the Viceroy's Legislative Council, which consists of the ordinary seven members

along with 29 nominated and 32 elected members. Madras, Bombay, Bengal, Bihar and Orissa, the United Provinces, the Punjab, and Burma have similarly constituted but smaller Legislative Councils which pass laws for their own provinces, with the approval of the Viceroy in Council. Besides these provinces, there are large parts of India called native states, which are under the protection of the British Government, but are governed by their own rulers. The relations between the paramount power and these states are settled by treaties.

1. The states are not allowed to have diplomatic or political dealings with other states or foreign powers, but their subjects abroad are as much entitled to the protection of the British flag as the inhabitants of British territory.

2. The paramount power takes over the duty of providing for the defence of these states: they are expected to help in this when necessary, but are not required to keep up a large army.

3. The management of their internal affairs belongs wholly to the rulers of the most important states, but the paramount power can interfere to set right abuses which threaten anarchy and bloodshed, or to take temporary charge of the administration—for example, when the ruler is a minor.

In the states of Hyderabad, Mysore, Baroda, and Kashmir the relations with the paramount power are carried on through a Resident appointed to each, communicating directly with the Government of India. In the Rajputana States, the Central India States, and in Baluchistan, the Resident or Agent of the states is subordinate to the Agent to the Governor-General. In the states under Bengal, the United Provinces, the Punjab, the Central Provinces, Bombay, Madras, and Burma, the Agent to the state is subordinate to the Local Government.

Some of the rulers of these states are foreigners. The Nizam of Hyderabad is a Mohammedan, but the people of his state are almost all Hindus. Gwalior, Indore, and Baroda are under Maratha rulers, but only very few of their subjects are Marathas. Three-fourths of the people of the Hindu state of Kashmir are Mohammedans.

POLITICAL DIVISIONS OF THE INDIAN EMPIRE.

The Indian Empire may be divided into four parts—*India proper*, *Frontier India*, *Burma*, and *Frontier Burma*.

1. **India proper** includes—(1) *British India*—that is, all the territories between the Himalayas in the north, their offshoots in the east and west, and the sea on the south, which have from time to time come under the authority of the British Crown. These are Bengal, Bihar and Orissa, Assam, the United Provinces of Agra and Oudh, the Punjab, Ajmer-Merwara, the Central Provinces and Berar, Bombay, Madras, Coorg, and the Andaman and Nicobar Islands.

(2) Those *native states* within the same boundaries, under British protection but not under British jurisdiction. These are the Rajputana Agency, Central India Agency, Hyderabad State, Mysore State, Baroda State, and the states * connected with Bengal, the new province of Bihar and Orissa, Assam, the United Provinces, the Punjab, the Central Provinces, Bombay, and Madras.

2. **Frontier India** includes those countries on the frontier which are British territory, such as British Baluchistan, or over which the British exercise some degree of protection because they are on the outer edge of the Empire. They are: (1.) In the north-west—Baluchistan, the North-west Frontier Province, and Kashmir; (2) in the north—Nepal, Bhutan, and Sikkim; (3.) in the north-east—the Assam border tribes and Manipur.

3. **Burma** (Upper and Lower), which is British territory.

4. **Frontier Burma**—that is, the country of the Burmese frontier tribes, some of which is British territory and some not.

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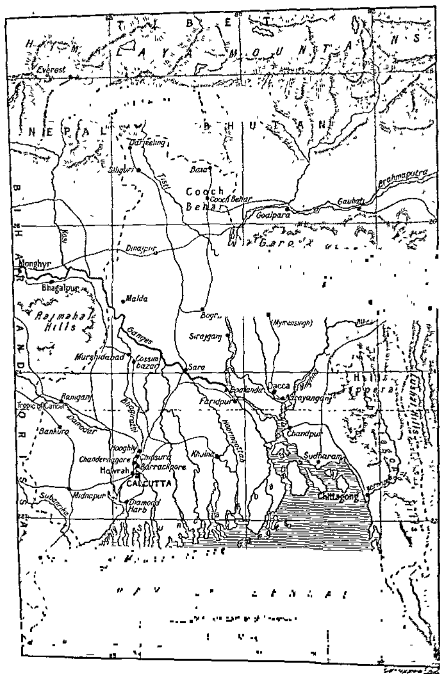
PROVINCES OF INDIA.

BENGAL.

The province of Bengal is roughly shaped like an isosceles triangle with its base on the Bay of Bengal and its apex touching the Himalayas in Kinchinjunga. It is bounded on the west by the (new) Province of Bihar and Orissa, and on the east by Assam and Burma.

Physical Aspects.—The whole of this vast triangle, except the mountainous apex, is low-lying and flat, and consists of deep fine silt brought down from the mountains by the Ganges and Brahmaputra, and by their countless feeders, large and small. Bengal is thus the gift of its rivers, and every part of it has, at one time or other, been delta-formed. The seaward edge of the province is made up of the Sundarbans, a network of estuaries, rivers, lagoons, and tidal marshes enclosing a vast number of islands which are themselves often half swamp. [*See p.* 67.] Of these the sacred island of Sagar is alone worth remembering. The land inland from this and right up to the foot of the Himalayas is low-lying. In many parts the rivers have built up their banks above the level of the surrounding country, so that the spaces between them are low, ill-drained, and water-logged. Thus in the rains a great part of Bengal is under water. Only in the frontier district of Darjeeling, between Nepal, Bhutan, and Sikkim, does the province extend into the Himalayas and become mountainous.

Climate, Rainfall, Soil, and Productions.—The climate of Bengal can be summed up in two words—*hot* and *damp*. The bay branch of the summer monsoon sweeps right across the country and dashes against the Assam Hills and the Himalayas, so that Bengal receives a plentiful and unfailing supply of rain. Famine is, in consequence, unknown. Besides the rain that falls in the province itself, Bengal gets the benefit through the Ganges, Bramahputra, and Meghna of much of the drainage of the Vindhya ranges and of the Himalayas and their eastern offshoots. In Bengal man does



T I B E T
H I M A L A Y A M O U N T A I N S
Everest
N E P A L
B H U T A N
Darjeeling
Siliguri
Tista
Baxa
Cooch Behar
Cooch Behar
Brahmaputra
Gauhati
Goalpara
Garo
B I H A R A N D O R I S S A
Kosi
Dinajpur
Monghyr
Bhagalpur
Malda
Rajmahal Hills
Bogra
(Mymensingh)
Ganges
Sirajganj
Murshidabad
Cossimbazar
Sara
Dacca
Meghna
Goalanda
Faridpur
Narayanganj
Hill Tippera
Raniganj
Tropic of Cancer
Damodar
Bankura
Bhagirathi
Haringhatta
Chandpur
Hooghly
Chinsura
Chandernagore
Barrackpore
Khulna
Sudharam
Howrah
CALCUTTA
Chittagong
Subanrekha
Midnapur
Diamond Harb
B A Y O F B E N G A L

25. BENGAL.

not trouble much about irrigation canals, for Nature, by her magnificent waterways, saves him the necessity. The soil is, almost everywhere, deep, rich, alluvial mud, well mixed and rubbed into the finest loam by the great rivers which, during thousands of years, have carried it down from the uplands and spread it over the surface of the land.

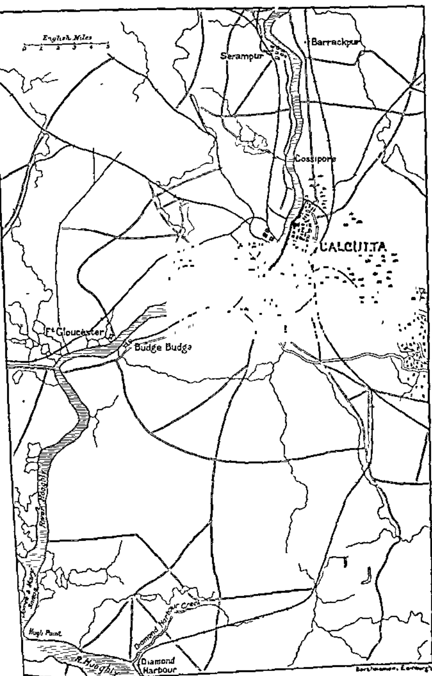
Crops.—**Rice.**—A flat country which is often flooded and a hot climate exactly suit paddy, which can here be grown without artificial irrigation, and two crops can generally be reaped. Bengal is really one vast paddy field, and is the chief rice-growing province in India. **Sugar-cane** is another plant which likes a damp, rich soil, and it is therefore also a large crop in Bengal. So, for similar reasons, is **tobacco.** **Wheat** is grown, but not nearly so largely as farther up the Ganges plains, where the greater cold of the winter months and the drier climate suit it better.

Jute.—*Bengal grows nearly all the jute produced in India.* One reason for this is that jute, being a plant which quickly exhausts the soil, can best be grown on fields which are constantly renewed by fresh layers of mud—exactly what happens in Bengal. Another reason is that the flat country abounds in marshes and stagnant pools, in which the plant, after being reaped, may be retted to prepare its fibres for manufacture. A great deal of jute is exported.

Tea is another important crop grown for exportation. The chief tea-gardens are on the Himalayan slopes round about Darjeeling. **Cinchona,** which flourishes only at a high elevation, is grown on a small scale by Government near Darjeeling.

Race, Language, and Religion.—In Bengal the people are of mixed Dravidian and Mongolian race, though certain classes are more or less of Aryan stock. The majority are Hindus, but Mohammedans predominate in the eastern parts of the province. Bengali is spoken everywhere.

Population.—Owing to the great fertility of the land and its minute cultivation, Bengal is very thickly populated. The number of waterways and the ease with which roads and railways can be made over the flat surface have rendered trade easy, and this has also helped the increase of population. Although the province has a population of over $4\frac{1}{2}$ crores, there are comparatively few towns. Bengal more than any other part of India is a country of villages and hamlets. The



26. CALCUTTA AND ITS RIVER.

towns are for the most part situated on the rivers and are engaged in river traffic. Many of them lie on the main waterway of the Bhagirathi (Hooghly) *e.g.* Murshidabad, Berhampore, Krishnagar, Santipur, Hooghly, Chinsurah, Chandernagore, Howrah, and Calcutta.

Cities and Towns.—Calcutta * (896, or, with suburbs, 1,043), lies along the left bank of the Hooghly about 80 miles from the sea. [*See map* 26.] It is the creation of modern commerce and, unlike most Indian cities, it is not old. When Delhi, Agra, Benares, and Lucknow were ancient towns, the site of Calcutta was occupied by three mud villages.

In 1686 the English merchants at Hooghly, with their President, Job Charnock, retreated down the stream to a spot on the left bank where they were protected from the Marathas on the other side, where was the highest point of the river which sea-going vessels could reach, and where they had a good anchorage. This was the beginning of the town, but modern Calcutta dates from 1756, when it was retaken by Clive and Watson from the forces of Suraj-ud-Daulah, and the first Fort William was built. From that time it has advanced steadily in size and importance till it is now, including its suburbs, the largest city in the British Empire except London.

Three causes have made Calcutta so important and prosperous:—

1. From 1772 to 1912 it was the capital of India, and its wealth and importance have increased as the Empire of India has grown and developed. Besides being the capital of India, it has also been the capital of the province of Bengal. A large population has grown round the centre where the Governments of India and of Bengal have had their chief offices, where the Law Courts are held, and where the University has its seat.

2. These would have made Calcutta an important town even if it had stood in a desert, but the city owes far more to the second cause—namely, **commerce**. Calcutta is the greatest commercial and trading centre, not only of India, but of Asia. This is largely due to its position. On land:—

(1.) Bombay is cut off from the rest of India by the Western Ghats; Madras has behind it the Deccan and Carnatic, where famine often prevails, and inland from Karachi stretches

* In this book the population of the cities is given in thousands, the last three ciphers being omitted.

the Great Indian Desert; but Calcutta lies close to wide fertile plains, and in the midst of a rich delta where famine is unknown.

(2.) *Calcutta is easily reached from all the* most important parts of Northern India. The country right up to the north-west frontier on the one side, and to the end of the valleys of Assam on the other, is flat. Hence *roads* can easily be made in all directions, *canals* can be dug where necessary, *railways* are cheaply and easily built, and the numberless *rivers* of the plains and deltas form natural waterways. On sea:—

(3.) Calcutta is the place where the roads, railways, and waterways of the land meet the great highway of the ocean. It is the great mart where the produce of India's plains is exchanged for the produce and manufactures of every country in the world.

The port of Calcutta extends for about five miles along the banks of the Hooghly, where ships lie at anchor in the river. There are also docks at Kidderpur. But it is only with difficulty that the Hooghly channel can be kept clear for the passage of ships, for its bed is always shifting and is apt to silt up. On the *James and Mary Shoal*, between Calcutta and the sea, many ships have been wrecked. To keep the fairway of the Hooghly clear, dredgers are constantly at work. No ship is allowed to go up or down without a trained pilot [illegible] pilots the state of [illegible] to Calcutta and

3. Calcutta is [illegible] manufacturing city in India. The chief o[illegible] and weaving of jute. [illegible] supplier of jute-cloth and [illegible] mills, paper mills, rope works (hemp and coir), sugar factories, engineering works, and iron foun[illegible] advantage to the manufactures of Calcutta is [illegible] coal-field, from which cheap fuel [illegible] and steamers. In the manufacture of jute, Calcutta has a great advantage in a monopoly of the crop, which grows at its doors, in cheap labour, cheap land, and cheap coal.

Calcutta, more than any other place in India, resembles a great English manufacturing town. For miles along the Hooghly banks stand mills with their tall smoking chimneys, and the river, with its crowded shipping, reminds an Englishman of the

Mersey or the Thames. Calcutta suffers from the disadvantage of its flat situation, which makes drainage difficult. In heavy rains a great part of the town is apt to be flooded. The native part of the city has grown so rapidly that much of it is badly built and overcrowded. Some of the public buildings are, however, very fine. *Howrah*, on the opposite side of the Hooghly, is really a suburb of Calcutta. Other suburbs are *Alipore, Cossipore* (with a gun factory), and *Garden Reach*, the two former now included in Calcutta.

Howrah (158) stands on the Hooghly, opposite Calcutta, with which it is connected by a bridge supported on boats. The city is a very good example of how quickly a town can increase by trade and manufactures in the modern days of steam and iron. A hundred years ago it was a small village; during the last thirty years its population has doubled, and its importance has vastly increased. There are three main reasons for this: (1) Howrah is the terminus of the East Indian and the Bengal-Nagpur Railways which carry the Ganges valley traffic to and from Calcutta; (2) it is really a part of the port of Calcutta and shares its immense foreign trade; (3) its jute mills, iron foundries, and other modern industries have largely increased and are increasing.

Dacca (109), the largest city in Bengal next to Calcutta and Howrah, stands on the Buriganga, and close to many other waterways. Unlike Calcutta it was a large and prosperous town before the days of British rule, and was for a century the court capital of the Mohammedan Governor. The chief of the court industries was the weaving of the world-famous fine muslins which were exported in large quantities to Europe, but during last century this industry declined owing to the competition of cheaper Manchester goods. In recent years, however, the weaving industry has revived, and Dacca exports large quantities of special cloth to Turkey and other Mohammedan countries. Owing to the fertility of the country round about, and to its nearness to several good waterways, Dacca is increasing in size and trade. It lies in the centre of the jute-producing districts, and is the most important inland mart in Bengal, being a centre for the collection and export of jute and oil-seeds. It is proposed to found a university at Dacca.

Chittagong, 12 miles up the Karnaphuli River, is one of the best ports in India, and exports the rice and jute grown in the eastern part of the province, and the tea of Assam. *It is now*

connected with the fertile Surma valley by a railway, which runs across the Cachar Hills and up the Assam valley. Chittagong is thus the direct sea-outlet of Assam.

Other Towns.—**Narayanganj, Sirajganj, Goalundo,** and **Nasirabad** are all important centres of jute and rice traffic on the Brahmaputra and its branches.

Raniganj, in the Damodar valley, though small, is one of the busiest places in Bengal, and is the centre of the largest coalfield in India. Potteries and paper-mills, attracted by the coal, have been started. It is close to **Asansol,** the railway junction from which the coal is sent to all parts.

Darjeeling, 7,000 feet above sea-level, on the Himalayas,

Native State.—Hill Tippera is a small state lying among the mountain ridges which separate India from Burma.

History.—After the battle of Buxar in 1764 the *diwani* of Bengal, Bihar and Orissa was conferred on the East India
at that
Orissa
second
a Raja
of Nagpur. Other provinces, known as the ceded and conquered provinces, were added as conquests went on, but in 1836 these were separated from Bengal under the name of the North-West Provinces. In 1874 Assam was separated from Bengal, and made into a province by itself. In 1835 the Raja of Sikkim ceded the hill station of Darjeeling, and the country round it was annexed in 1850. In 1905 the Government of India resol
its work.
ment prop
population. Accordingly the eastern part of Bengal (consisting of the Chittagong, Dacca, Rajshahi divisions, the district of Malda and the state of Hill Tippera) was transferred to Assam and formed into a new province to be called Eastern Bengal and Assam. At the same time five Hindu-speaking states in Chota Nagpur were transferred to the Central Provinces and five Uriya-speaking states were taken from the

Central Provinces and added to the Orissa division of Bengal. In 1912, following on the King-Emperor's Proclamation at the Delhi Durbar the previous year, a fresh division was made as follows :—

1. The Bhagalpur (except Darjeeling district), Patna, Tirhut, Chota Nagpur, and Orissa divisions, which till then formed part of the province, were cut off and formed into a new province to be called Bihar and Orissa.

2. Assam was detached from Bengal and formed into a separate province as it used to be.

3. The Eastern Bengal parts of the old province which had been cut off in 1905 were restored to Bengal, and the Presidency of Bengal now consists of the divisions of Burdwan, Presidency, Rajshahi, Dacca and Chittagong, and the district of Darjeeling.

BIHAR AND ORISSA.

This newly-formed province occupies a roughly rectangular area between the Himalayas and the Bay of Bengal. It consists of the flat, low-lying alluvial plains of the Ganges in the north, the table-lands of Chota Nagpur and Orissa in the south and west, and the flat delta of the Mahanadi along the shores of the Bay of Bengal.

Boundaries.—N. Nepal. E. Bengal. S. The Bay of Bengal. and Madras. W. The Central Provinces and the United Provinces.

Points for the eye to remember.—The point where the Ganges receives the Gogra in the west and the point where it bends round the Rajmahal Hills in the east : the Chilka Lake. Note that the province extends beyond the Ganges in the north and beyond the Mahanadi in the south.

Physical Aspects. — **Table-land.**—The great bulk of the province is taken up by the Chota Nagpur table-land, extending inland into the Central Provinces. Here the country is quite unlike flat Bengal, being broken into numerous groups and ranges of hills which, in Orissa, rise to considerable peaks. These hills are often steep, and are separated by deep ravines or open valleys. They are covered with coarse grass or jungle, and only their valleys are cultivated.

Plains.—The most fertile and important parts of the province



27. BIHAR AND ORISSA.

are the plains. On both sides of the Ganges in its course eastwards to the Rajmahal bend there is a broad, flat, and very fertile alluvial plain. In the north this plain stretches to the foot of the Himalayas, and in the south slopes gradually up to the Chota Nagpur table-land. Here population is densest and the towns and villages most numerous.

Delta and Coast-strip.—The flat deltas of the Mahanadi and Brahmani are also very fertile and thickly populated.

Climate, Soil, and Productions.—The climate of the province is on the whole hotter in summer and cooler in winter than in the deltas of Bengal. The rainfall is plentiful everywhere. In the low-lying plains of the Ganges and in the Mahanadi delta the soil is deep, fertile alluvium, and the land is watered by many rivers. On the uplands of the table-lands, however, the soil is less fertile, being gravelly and rocky, and the slope quickly carries off the water of the hill streams into the larger rivers. The best land in the table-land is in the valleys, where it is levelled and carefully cultivated with crops such as paddy and sugar-cane. The less fertile slopes are roughly planted with maize, oil-seeds, and pulses.

Owing to the warm climate, good rainfall, and fertile soil, the chief crop is everywhere rice, and in most parts two harvests of it are reaped every year. The largest crops are, of course, grown on the flat plains of the Ganges and on the well-watered Mahanadi delta. Maize, pulses, and oil-seeds are grown on the less fertile and drier lands. In the districts watered by the Son, the Gogra, and Gandak the white poppy is a large crop, and the opium is manufactured in Patna. Indigo is also still an important crop here. On the whole the province is one of the most fertile parts of India.

Race, Language, and Religion.—The people of the province are, in the main, of Dravidian race, but in the north there is a strong mixture of Aryan blood and in the south of Mongolian. The wild tribes of the Chota Nagpur highlands are almost pure Dravidians. The people nearly all speak Aryan languages—Bengali and Hindi in the north, and Uriya in Orissa. The hill tribes speak Dravidian dialects. Hinduism is the prevailing religion, but the rude tribes in Chota Nagpur and the hill tracts of Orissa are mostly Animists.

Population and Towns.—Owing to its fertility the province is thickly populated—most thickly in the fertile plain

and delta, least thickly in the jungle-clad hills of Chota Nagpur and Orissa. The towns are mostly on the banks of rivers, chiefly the Ganges and its tributaries. They have long been centres of river traffic, but in modern days the railways carry most of their trade. From the spot in the west of the province where the Ganges receives the Gogra to where it bends round the Rajmahal Hills in the east many river ports can be seen on the map.
Gandak, Patna c
Gandak, Darbha
Bhagalpur, and Rajmahal on the Ganges.

Patna (136), the most important of these, is the capital of the newly-formed province. It is an example of a city, formerly a great trade centre, which has till lately been decreasing in population. As the capital of the newly-formed province it is, however, bound to increase in size and in importance. Patna has always owed its importance to its position. The

Gangetic valley and Bengal passed through Patna, but in modern times the railway which conveys goods quicker than boats, has taken away a good deal of the trade of the city.

In fact the three places form one long town along the right bank of the Ganges.

Gaya, south of Patna, is surrounded by sacred spots, and is therefore a place of pilgrimage. Near it is Buddh-Gaya, with a Buddhist shrine and the ruins of a palace of Asoka. Here can be seen the sacred *pipal* tree, said to be grown from the one under which Gautama sat. Bihar town is supposed by some to have been the capital of the ancient kingdom of Maghada.

The Chota Nagpur
fertile than the rest,
two small towns—Ra
missionary centre.
place of Jain pilgrir
town. It is a "fort" town, and, being well situated for traffic by road, river, canal, and railway, is the trade centre of the

fertile delta in the midst of which it stands. **Puri**, on the coast, south of Cuttack, is one of the most sacred places of Hinduism. During the great car festival of Jagannath, over a lakh of pilgrims visit the temple The town itself is simply a collection of lodging-houses. **Chandbali** and **Balasor** are two small seaports. In former times, before the Hooghly was deepened, Balasor, owing to its safe roadstead, was a transhipping place for Calcutta sea trade. Here ocean-going vessels loaded and unloaded cargo from and into smaller craft which could navigate the shallow Hooghly. After that river was deepened by dredging, Balasor lost this trade. **Sambalpur**, far up the Mahanadi, is the limit of boat traffic on that river. It is the centre of a fertile district.

Native States.—**The Tributary Mahals of Orissa** comprise seventeen small states (to which in 1905 five states were added from the Central Provinces), and they occupy the hilly country lying inland from the Mahanadi delta. This hilly country is watered by the three large rivers, the Mahanadi, Brahmani, and Baitorani. The hills are covered with dense forest and jungle, and cultivation is carried on only in the valleys.

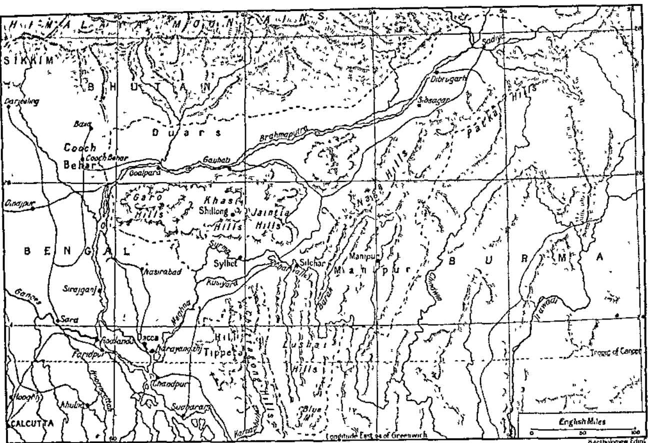
Chota Nagpur States, two in number, are also in hilly country, and are inhabited by a backward people.

Cooch Bihar consists of a low-lying strip at the foot of the Bhutan Hills. A railway joins the state with the main lines.

History.—This new province was constituted in 1912. The Bhagalpur (except Darjeeling district), Patna, Tirhut, Chota Nagpur, and Orissa divisions, which till then formed part of Bengal, were formed into a new separate province, to be called Bihar and Orissa, under a Lieutenant-Governor. The seat of government is at Patna.

ASSAM.

Assam is a country of forest-covered hills and two important valleys. In shape it resembles an isosceles triangle pointing north-east, with its vertex at the Himalaya bend of the Brahmaputra and its base the zig-zag line separating it from Bengal. One side of this triangle runs between the Himalayas and the Brahmaputra, and the other along the line of the Patkai and Lushai Hills south to the Blue Mountain.


HIMALAYA MOUNTAINS
SIKKIM
BHUTAN
Darjeeling
Baxa
Duars
Coach Behar
Cooch Behar
Goalpara
Gauhati
Brahmaputra
Dibrugarh
Sibsagar
Sadiya
Patkai Hills
Naga Hills
Garo Hills
Khasi Hills
Shillong
Jaintia Hills
Dinajpur
BENGAL
Surma
Sylhet
Silchar
Cachar Valley
Manipur
Barak
Chindwin
BURMA
Irawadi
Nasirabad
Kusiyara
Sirajganj
Ganges
Sara
Meghna
Goalundo
Dacca
Narayanganj
Faridpur
Hill Tippera
Lushai Hills
Chittagong Hills
Blue Mt.
Chandpur
Sudharam
Karnafuli
Hooghly
Khulna
CALCUTTA
Tropic of Cancer
English Miles
0
50
100
Longitude East 94 of Greenwich
Bartholomew Edin.

28. ASSAM.

Physical Aspects.—1. The Brahmaputra valley extends from the Himalaya bend to the Garo bend of the river, and lies between the Himalayas on the north and the line of the Patkai, Naga, Jaintia, Khasi, and Garo Hills on the south.

2. The Surma valley, or Sylhet Plain, geographically forms part of the great plain of Bengal. It is watered by the Barak, which, after flowing northwards from the long parallel ranges of the Lushai Hills into the Cachar valley, splits into two streams, the Surma and the Kusiyara. These two rivers water the valley, and rejoin before flowing into the Meghna. The Sylhet Plain is thus really the delta of the Meghna.

3. A great mass of forest-covered hills, jungles, and marshes, inhabited by wild tribes, and but little known, fills up the rest of the triangle of Assam.

Climate and Productions.—Assam is the dampest part of inland India; it rains during eight months in the year, and fogs are common. This rain and damp are suitable to the growth of tea, timber, and rice.

Tea likes a damp climate and well-drained soil—just what it gets on the rainy slopes of the hills. Assam produces nearly two-thirds of all the tea grown in the Indian Empire. The finest tea is grown round Sadiya, near the frontier, at the extreme end of the Brahmaputra valley.

Timber.—Assam has the largest area of virgin forest of any province of the Indian Empire except Burma.

Rice is grown in the valleys, and its cultivation is increasing as the jungle is cleared. **Jute** cultivation is now also spreading up the valleys. The damp, warm climate also suits the growth of the india-rubber tree.

On the whole, Assam produces little in comparison with its area; only the valleys are cultivated.

Race, Language, and Religion.—In Assam the people are of Tibeto-Burman race. Two Aryan languages, Assamese and Bengali, are most commonly spoken, and the hill tribes speak dialects of the Tibeto-Burman tongues. Hinduism is the prevailing religion, but the hill tribes are Animists.

Population and Towns.—Owing to the mountainous nature of the country and the prevalence of a kind of fever

called *kala-azar*, the population is thin, except in the Surma valley. The Assamese are lazy, and leave trade and handicrafts to the foreigner. Thus, in recent years, large numbers of immigrants from Bengal have come to Assam to work in the tea-gardens. As these tea-gardens are scattered among the hills, and as communication, except by water, is difficult, trade does not gather into large centres. The towns are small, and are nearly all on the great waterways. Thus (1) in the Brahmaputra valley **Goalpara**, **Gauhati**, **Sibsagar**, and **Dibrugarh** are centres of river traffic in tea, timber, and rice: (2) in the Surma valley **Sylhet** is the largest town in Assam; **Silchar** lies on the Barak, in the Cachar valley; **Shillong**, nearly 5,000 feet above sea-level, is a healthy hill station.

Industri[illegible]
is the chief [illegible]
making tea- [illegible]
to the hea[illegible]
Brahmaputra is navigable by steamers as far as Sadiya and the Barak as far as Silchar In the rainy weather there are hundreds of smaller rivers large enough to form waterways both in the Brahmaputra and Cachar valleys A railway now runs from Chittagong up the Cachar and Brahmaputra valleys to Sadiya.

Native State.—**Manipur**, with a capital of the same name, is a long oval-shaped valley among the Lushai Hills in the south-east corner of Assam. It is difficult to reach, but a railway has now been built from Bengal as far as the Cachar valley.

History.—Assam includes—(1) (*a*) the Sylhet or Surma valley, and (*b*) the Goalpara district of the Brahmaputra valley, both of which originally formed part of the *diwani* of Bengal ceded to the East India Company in 1764; (2) Assam proper, or the upper valley of the Brahmaputra, and the Cachar valley, both of which fell into British hands as the result of the first Burmese War; (3) the hill districts which have from time to time been brought under British authority; (4) part *of the Western Duars, a Sub-Himalayan tract lying to the* south of Bhutan, which was annexed after the Bhutan War of 1864. All these, which up to 1874 formed part of the province of Bengal, were in that year formed into the separate province

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Industries and Communications.—The [illegible] is the cl[illegible] making [illegible] to the [illegible] Brahmaputra is navigable by steamers as far as [illegible] the Barak as far as Silchar. In the rainy season [illegible] hundreds of smaller rivers large enough to [illegible] both in the Brahmaputra and Cachar valleys [illegible] now runs from Chittagong up the Cachar and [illegible] valleys to Sadiya.

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of Assam, under a Chief Commissioner. In 1905 a further slice of territory was added. The Chittagong, Dacca, and Rajshahi divisions of Bengal, the district of Malda, and the state of Hill Tippera were taken from the old province of Bengal and added to Assam. The province thus formed under the name of Eastern Bengal and Assam was placed under a Lieutenant-Governor. In 1912 the old arrangement was reverted to, and Assam was reconstituted as a separate province under a Chief Commissioner.

THE UNITED PROVINCES OF AGRA AND OUDH.

The United Provinces * of Agra and Oudh consist of the plains of the Upper Ganges, the Jumna, and their tributaries, together with the hill tracts north and south. [*See map* 29.]

Boundaries. — Himalaya-wards, Tibet and Nepal. India-wards, the Punjab, Rajputana, Central India, Bihar and Orissa.

The Himalayan boundary of the United Provinces is our "second step of a stair" in the outline of India—namely, (1) *along the inner Himalayas from the source of the Jumna* to the Kali or Sarda River; (2) down the Kali till it enters the plains; (3) thence along the Sub-Himalayas as far as the Gandak. The boundary on the west and south runs (1) down the Jumna to a point half-way between Delhi and Agra; (2) thence in an irregular line south of the Jumna and Ganges to Chapra.

Points for the eye to remember.—(1) Jamnotri, the north-west corner; (2) the line of the Jumna; (3) the line of the Kali through the Himalayas; (4) Chapra, in Bihar.

Physical Aspects.—The United Provinces can be naturally divided into three regions.

(1.) The Himalayan mountain region.

(2.) The Vindhyan hill region south of the Ganges and Jumna.

(3.) The great plain lying between them.

1. *The Himalayan Mountain Region.*—This consists of the three ranges of the Himalayas—namely, the Sub-Himalayas, here called the Siwaliks; the outer Himalayas, covered with great forests; and the inner Himalayas, with the mighty

* Known as the North-Western Provinces and Oudh up to 1901.

snow-clad peaks of Nanda Devi, Kamet, and Badrinath, all over 25,000 feet in height.

2. *The Vindhyan Hill Region.*—These hills consist of the Kaimur offshoots of the Vindhyas, which come down in terraces to the Jumna a[illegible] from the Himalayas, as [illegible] small rainfall, and are [illegible] owing to the heat and [illegible] there are few animals, and scarcely any birds.

3. *The Great Plain.*—This occupies the great bulk of the province, and is one of the richest, best irrigated, and most highly cultivated regions of the earth. It may be divided into two parts: (1.) The Great Doab,* or country between the Jumna and Ganges. This is a stretch of perfectly flat country, very fertile, and splendidly irrigated, bearing great crops of wheat, barley, sugar-cane, cotton, millets, indigo, and opium. The people are famous farmers. In some parts of the Doab, however, there are *usar* lands—that is, patches made sterile by *reh*, a snow-like deposit of salt which comes to the surface after rain and destroys vegetable life. (2.) Oudh, Rohilkhand, and Gorakhpur. This region, comprising the rest of the plains, is also very fertile. It is damper, cooler, more wooded, and less troubled with *reh*. Being damper than the Doab, it grows more rice and less wheat.

Mountains.—The *Garhwal Ranges of the Himalayas*, on the spurs of which are the great peaks of Nanda Devi and Badrinath already mentioned. The *Siwaliks*, or Sub-Himalayas, 2,000 feet high, enclosing valleys called duns or doons.

Rivers.—The *Jumna, Ganges, Ramganga, Sarda, Gogra, Rapti* from the Himalayas, and the *Gumti* from the plains of Oudh—all from the north. The *Chambal, Sind, Betwa*, and *Ken*, flowing into the Jumna from the south.

Climate, Rainfall, Soil, &c.—The climate on the whole is cooler and drier than that of Bengal, though in the hot weather the heat is fiercer in the plains. But there is a temperate climate in the cold weather. The rainfall is much less than that of Bengal. It is heavy on the outer Himalayas, but only about 40 inches over the middle of the provinces, and less than 30 inches south of the Ganges. The natural waterways are not so numerous as in Bengal, and

* *Do-ab* means "two rivers."

of Assam, under a Chief Commissioner. In 1905 a further slice of territory was added. The Chittagong, Dacca, and Rajshahi divisions of Bengal, the district of Malda, and the state of Hill Tippera were taken from the old province of Bengal and added to Assam. The province thus formed under the name of Eastern Bengal and Assam was placed under a Lieutenant-Governor. In 1912 the old arrangement was reverted to, and Assam was reconstituted as a separate province under a Chief Commissioner.

THE UNITED PROVINCES OF AGRA AND OUDH.

The United Provinces * of Agra and Oudh consist of the plains of the Upper Ganges, the Jumna, and their tributaries, together with the hill tracts north and south. [*See map* 29.]

Boundaries.—Himalaya-wards, Tibet and Nepal. India-wards, the Punjab, Rajputana, Central India, Bihar and Orissa.

The Himalayan boundary of the United Provinces is our "second step of a stair" in the outline of India—namely, (1) along the inner Himalayas from the source of the Jumna to the Kali or Sarda River; (2) down the Kali till it enters the plains; (3) thence along the Sub-Himalayas as far as the Gandak. The boundary on the west and south runs (1) down the Jumna to a point half-way between Delhi and Agra; (2) thence in an irregular line south of the Jumna and Ganges to Chapra.

Points for the eye to remember.—(1) Jamnotri, the north-west corner; (2) the line of the Jumna; (3) the line of the Kali through the Himalayas; (4) Chapra, in Bihar.

Physical Aspects.—The United Provinces can be naturally divided into three regions.

(1.) The Himalayan mountain region.

(2.) The Vindhyan hill region south of the Ganges and Jumna.

(3.) The great plain lying between them.

1. *The Himalayan Mountain Region.*—This consists of the three ranges of the Himalayas—namely, the Sub-Himalayas, here called the Siwaliks; the outer Himalayas, covered with great forests; and the inner Himalayas, with the mighty

* Known as the North-Western Provinces and Oudh up to 1901.

other province. *They are the great grain-growing districts of India (excluding rice).* They stand first for wheat, *barley*, and other *food grains* (including millets, maize, pulses, etc.), *sugar-cane* and *opium*.

Wheat and Barley.—These are the chief cold weather crops.

Other Food Grains.—These are suited to the United Provinces, as they do not require much rain.

Sugar-cane.—This is largely grown on the irrigated lands.

Opium is cultivated in the south eastern corner round Benares, and is called *Bengal* opium.

Rice is also grown, but not nearly so largely as in Bengal, Burma, and Madras with their river deltas.

Cotton.—The black cotton soil is not so extensive as that of Madras, Berar, or Bombay, but a good deal of cotton is grown south of the Jumna.

In **oil-seeds, spices,** and **indigo** the United Provinces take an inferior place.

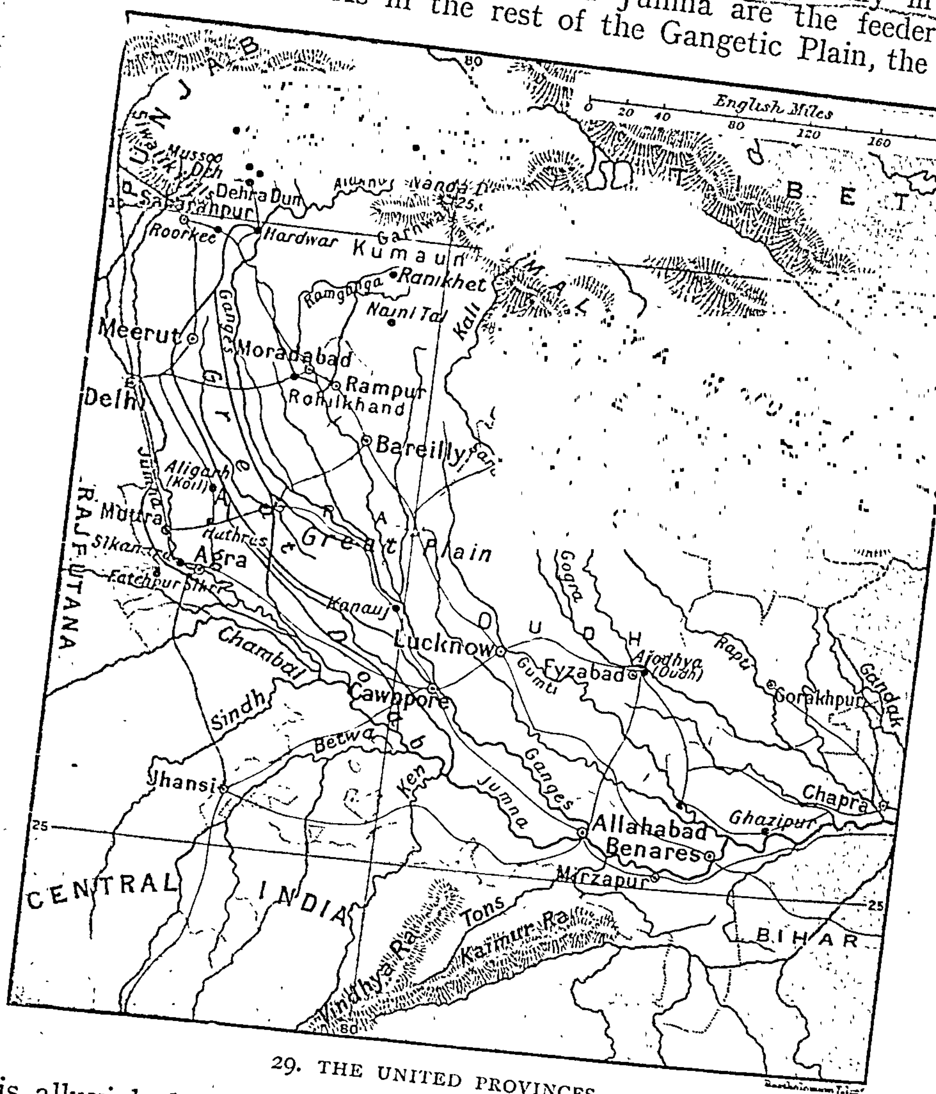
Some **tea** is grown on the Himalaya slopes.

Race, Language, and Religion.—The people are of a mixed *Aryo-Dravidian* race. The *Hindus* number *about* 85 *per cent.*, and the Mohammedans about 15 per cent. of the population. *Hindi* is the language mostly spoken.

This is the *most densely populated* province in the Indian Empire, but it does not contain so many people as Bengal did before it was divided, nor as Bengal proper does now. The population is nearly fifty millions. Owing to the number of towns, the percentage of the urban population is comparatively large. The population of the United Provinces decreased in 1901–11.

Cities and Towns.—The tract of country now covered by the United Provinces has been for many ages the most famous part of India. Before history was written it was the Madhyadesa or Middle Land described in the holy books and poems of the Hindus: in it are found the most sacred places in India such as Benares, Kanauj, Hardwar, Muttra, and Ajodhya. It contains the birthplace of Buddha and is the cradle of his creed. In later times the Afghans and Moghals had here their capitals, Delhi and Agra. As this part of India has been for so long the centre of civilisation we naturally here find many towns, the capitals of former kingdoms and chiefships. There are also seven cities, a larger number than in any other province of India. The cities and towns are almost all on the Ganges or its tributaries, which in old times were the

irrigation canals have had to be dug, especially in drier parts. The Ganges and Jumna are the feeder the canals. As in the rest of the Gangetic Plain, the



29. THE UNITED PROVINCES.

is alluvial, deep, and fertile; but parts of it are destroyed by *reh*.

Productions.—On the whole, the United Provinces are inferior to Bengal in fertility, but they are superior to any

other province. *They are the great* [illegible] *India (excluding rice).* They stand first for wheat, barley, and other *food grains* (including millets, maize, pulses, etc.), *sugar-cane* and *opium*.

Wheat and Barley.—These are the chief cold weather crops.

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chief highways of trade. *On the Ganges*—Ghazipur, Benares, Mirzapur, Allahabad, Cawnpore, Kanauj, and Hardwar. *On the Jumna*—Agra and Muttra (Mathura). *On the Ramganga*—Bareilly, Moradabad. *In the Doab*—Meerut, Saharanpur, and Roorkee. *In Oudh*—Lucknow (on the Gumti), Faizabad and Ajodhya (on the Gogra).

Benares (204), the largest city in the province outside of Oudh, is very old. From the earliest times of Aryan civilisation a city has stood on the spot. Here the sacred Ganges turns northwards towards the Himalayas, the abode of Shiva, so that the city built on the sloping left bank forms a long line of temples and burning and bathing ghats facing the rising sun. The city is full of sacred spots, and places of pilgrimage. As the story of Delhi is the history of India, so the story of Benares, if it were ever written, would be the history of Hindu religion and philosophy. Calcutta is the capital of an Empire: Benares is the capital of a creed. Benares owes its wealth and importance to the thousands of wealthy pilgrims who come every year from all parts of India to the sacred city of Hinduism. Viewed from a boat in mid-stream the city with its gilded minarets and its crowds of pilgrims, bathing or praying beside the sacred stream, is very striking; but a walk through its narrow streets, filled with beggars, asses, and sacred bulls, is not so pleasant. The chief building is Aurangzeb's mosque, but to Hindus the sacred temple of Durga Kund is the most important. In Benares old industries, such as the manufacture of brass vessels, silk cloths, jewels, and toys, still flourish. It is, besides, the centre of a large fertile district, on a river crowded with boat and light steamer traffic; and now four lines of railway meet in the city.

Cawnpore (195) is quite unlike Benares. It is a modern town and owes its importance to modern manufactures. It was not heard of till the British got permission to quarter troops here after the battle of Buxar in 1764, and it only began its modern career after the annexation of Oudh. As Cawnpore is almost the only example of an inland town in India which has, like those of Britain and America, grown to importance by the help of modern manufactures, it is interesting to study some of the causes of its rise and progress. In the first place it stands on the Ganges and in the centre of the fertile Jumna-Ganges doab. Secondly, if we look at

a good map we see that Cawnpore is the meeting-place of five of the principal railways of Upper India, which makes it a great centre for collecting and distributing the trade of the rich United Provinces. It was, in fact, the building of the railway bridge across the Jumna at Allahabad, joining Cawnpore with the cities of Bengal, that gave the town its first start as a focus for the export and import trade of the province. When this was done, many rich merchants of other towns on the Ganges transferred their business to it. These merchants were followed by large numbers of petty dealers, craftsmen, and tradesmen, who form such a large proportion of its population At the present day it is, unlike most Indian towns, full of factories and workshops. Its industries depend chiefly on leather, cotton, and wool. There are plenty of cattle and goats in the country round about, and plenty of people of the Chamar caste to tan the skins. In this way Cawnpore has become the chief town in India for the making of harness, saddlery, boots and shoes. The cotton mills turn out all kinds of woven cotton goods, including tents. The wool mills make serge, flannel, blankets, and stockings. Besides these there are mills for cleaning and pressing cotton, a jute mill, a sugar refinery, a brush factory, a chemical work making sulphuric acid, soda, and writing inks, and an iron foundry. Here Government get the tents, saddles, harness, boots, sheeting, and blankets required for the Indian army. These things show us that Cawnpore is the largest and most important inland manufacturing town in the Indian Empire. Its trade and population have increased enormously in recent years.

Here during the Mutiny of 1857 the massacre of the garrison and a large number of women and children took place.

Agra (185), on the Jumna, is a city old in years, but it is drawing new life from trade and manufactures. Everywhere in the city is seen the hand of the great Moghal emperors. The town itself is handsome, and better built than any other in the province. Agra is a city of fine buildings. Akbar founded the city, and built the fort in 1566, and soon after began the Fatehpur Sikri palace and the Sikandra (where he lies buried), both at some distance from the city. Shah Jahan either built or finished the Moti Masjid, or Pearl Mosque, and the Jama Masjid. But

the finest building in Agra is the Taj Mahal, the "bubble in marble," which Shah Jahan built as a tomb for his wife. It is the finest piece of Mohammedan architecture in India, and perhaps the most beautiful building in the world. The history of the great Moghal Empire at its zenith can be read in the magnificent marble buildings within the red sandstone fort at Agra. In modern times Agra is renewing its youth, and increasing in wealth and population. It is the central grain market for a large district, has cotton mills, and leather and boot works. It has also now become a great railway centre, being connected with Karachi and Bombay, and with the railway system of its own province. A branch of the Ganges canal, and the Jumna also, bring in some traffic by water.

Allahabad (172), the capital, has always owed its importance to its situation at the confluence of the Ganges and Jumna. This confluence has made it both a sacred spo (the Prayag of the Hindus) and an important centre for rive traffic. These two points of importance are illustrated by the Magh Mela or great religious fair, held in December and January every year, which attracts as many as 250,000 pilgrims and traders from all parts. It has thus always been an important city, but the fort and city as they now stand were built by Akbar. In modern times Allahabad s not noted for any great manufactures; it is rather the entre to which goods from all quarters of the province re sent in order to be distributed over the country. Its hief importance nowadays is due to its central position the railway system of India. It lies half-way between alcutta and the Punjab, and through it passes most of he traffic between Bombay and the fertile Gangetic Plain. is also the seat of the United Provinces Government, and a university.

Bareilly (129), in Rohilkhand, has always been a garrison y, round which a large civil population is gathered. It s so in the time of the Moghals, who quartered troops here the defence of the eastern frontier of their empire; and modern days it has a large cantonment of British and ive troops, and is the headquarters of a division of the ny. Commercially it is not important.

Meerut (116) is at least as old as the times of Asoka, who cted one of his pillars here. A hundred years ago it was

"ruined, depopulated, and a place of no trade"; but, since it was selected as the quarters of a large garrison, it has increased in population and importance. Here the Mutiny broke out in May 1857.

Lucknow (259), the former capital of the kingdom of Oudh, and now capital of that province, is the fifth largest city in India. It is full of mosques, tombs, palaces, temples, mansions, and gardens built by the Nawabs of Oudh and their nobles, but these cannot compare in beauty with the buildings of Agra and Delhi. Lucknow is a good example of a city built round the palace and fort of a ruler who spent the revenues of his kingdom on luxuries. The city is even now filled with workers in silver, gold, and ivory, makers of muslins, silks, and glass-work. In modern times it cannot keep pace with towns like Agra and Cawnpore, and its population is slowly decreasing. During the Mutiny the Residency, held by a small British garrison, was for long besieged by the rebels.

Other Towns.—Hathras, in the Doab, is one of the chief trading towns in the province. **Ghazipur** is the Government depôt for opium. **Mirzapur** manufactures shellac, and is a mart for grain and cotton. **Kanauj**, near Cawnpore, now in ruins and deserted by the Ganges, was a centre of ancient Aryan civilisation **Hardwar,** where the sacred Ganges enters the plains, is a place of pilgrimage. **Muttra** (Mathura) is an ancient sacred Hindu city with fine buildings. **Moradabad** has metal, brass, and tin manufactures on a small scale. *Saharanpur is the headquarters of the Jumna canal establishment.* **Roorkee,** before the digging of the Ganges canal, was a mere mud village; it is now a flourishing town, and the headquarters of the canal workshops. Here is the Thomason Civil Engineering College, the most important of its kind in India. *Aligarh,* north-east of Muttra, is famous for its college for Mohammedans. **Jhansi,** on the narrow neck of British territory separating the two parts of Central India, is the meeting-place of four railway lines. **Faizabad** was the former capital of Oudh, till Asaf-ad-Daulah moved the court to Lucknow. **Ajodhya,** adjoining Faizabad, an ancient Hindu capital, is now in ruins.

Hill Stations.—Mussoorie, on the Himalayas, overlooking Dehra Dun valley beyond the Siwaliks; **Naini Tal,** on a lake in Kumaon; **Chakrata, Landour, and Ranikhet.**

Industries.—Cawnpore is the chief manufacturing centre of the United Provinces, where there are cotton and woollen mills, one small jute mill, and large leather works. There

are breweries on the hills. There are many indigo factories; but they are not prosperous. Owing to the number of large towns in the province, there are many flourishing arts and crafts.

NATIVE STATES.

Rampur, a small state in Rohilkhand, which represents all that remains of the Rohilla Confederacy. Protection was promised to the state by the British after the Rohillas were defeated by the troops supplied by Warren Hastings to the Nawab Wazir of Oudh. The chief is a Mohammedan.

Tehri, or native Garhwal, lies high up in the Himalayas, round the sources of the Ganges. The state is mountainous, and therefore thinly populated. The ruling Rajput family was expelled by the Gurkhas in 1804, but at the end of the war the territory to the west of the Alaknanda was restored to the Raja.

History.—The territories obtained from the Nawab of Oudh in 1775, 1798, and 1801, and those won by Lord Lake from Sindhia of Gwalior in 1803, were originally attached to the province of Bengal under the name of the Ceded and Conquered Provinces. In 1816, by the Treaty of Sagauli, the districts of Kumaon, Garhwal, and Dehra Dun were taken from their Gurkha invaders and added to British territory. In 1836 the Ceded and Conquered Provinces, thus enlarged, were made into a separate province, called the North-Western Provinces. In 1856 the kingdom of Oudh was added to them by Lord Dalhousie, who at the same time deposed the king for continued misgovernment. After the Mutiny of 1857 Delhi, with the surrounding country, was taken from the province and attached to the Punjab, while a large slice of territory was at the same time transferred to the Central Provinces. In 1901, when the new North-West Frontier Province was formed, the name of the North-Western Provinces was, in order to avoid confusion, changed to the United Provinces of Agra and Oudh.

THE PUNJAB.

The Punjab is a country of doabs and deserts. [*See map* 30.]

Shape.—The Punjab resembles a huge W with its left leg longer than its right.

Boundaries.—W. The North-West Frontier Province (beyond the Indus), and Baluchistan (beyond the Sulaimans). E. The

United Provinces (beyond the Jumna), and Tibet (beyond the Himalayas). N. Kashmir. S. Rajputana.

Points for the eye to remember.—(1.) The point where the Kabul River enters the plains—that is the north-west corner; (2.) a point on the Indus 100 miles below its junction with the Panjnad—that is the south-west corner; (3.) a point on the Jumna half-way between Delhi and Agra—that is the south-east corner.

Physical Aspects.—The Punjab consists of three parts: (1.) the mountainous country in the north and north-east; (2.) a table-land in the north-west; (3.) the plains in the east and west.

1. **Mountain Region.**—In the north-east the Punjab Province runs far enough up among the Himalayas to include a part of each of their three ranges.

2. **The table-land** lies north of the Salt Range and between the Indus and Jhelum. It is from 1,000 to 2,000 feet high, and is broken by ravines and nullahs.

3. **Plain Region.**—The rest of the country is a flat plain, most of it sloping very gently south-westwards in the direction of the flow of the rivers.

(1.) *Eastern Plains.*—These comprise all the plain country east of Lahore (in the right half of the W). They make up the most fertile part of the province; besides being watered by the Sutlej, Ghaggar, and Jumna, they are splendidly irrigated, and have a greater rainfall than the western plains. Hence there is a large population, with many towns.

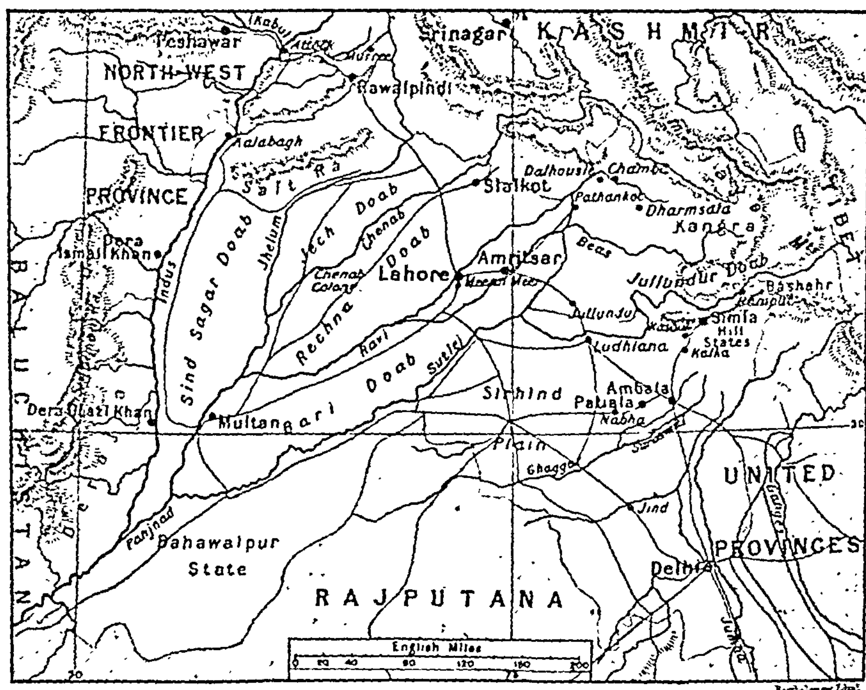
(2.) *Western Plains.*—The plains to the west of Lahore (in the left half of the W) have a fertile soil in some parts, but there is a want of rain. Cultivation is confined to a narrow strip along the river banks, and to the land irrigated by the flood canals of the Indus. In the south the country is little better than a desert. Hence the population here is scanty, and Multan is the only large town.

The plain region is made up of five doabs, and Sirhind, the Derajat, and Bahawalpur. Counting from west to east, these doabs are: (1.) the *Sind-Sagar Doab*, between the Indus and the [illegible] the Jhelum and [illegible] Ravi and Chenab; [illegible] (5.) the *Jullundur* [illegible] he Sulaimans and the Indus. The *Sirhind Plain* lies between the Sutlej and

Jumna; here is the *watershed between the Ganges and Indus river systems.* *Bahawalpur* is a native state embracing the desert country of the Punjab south of the Sutlej, Panjnad, and Indus.

Mountains.—The *Himalayas*, in the north-east, running north-west to south-east. The *Sulaimans*, in the west, running nearly north and south. The *Salt Range*, in a curve, between the Jhelum and Indus.

Rivers.—The *Indus* for the first half of its course in the



30. THE PUNJAB PROVINCE.

province forms the western boundary; the second half is nearly 50 miles east of the Sulaimans. The Panjnad conveys into it the combined waters of the five Punjab rivers. The *Saraswati* and *Ghaggar*, between the Sutlej and Jumna, lose themselves in the desert; they are dry except in the rains.

Climate.—Owing to the dryness of the air the climate is one of extremes—very hot in the summer months, cold and even frosty in the winter.

Rainfall.—The Punjab has two periods of rain—the *monsoon* from June to September, and the *winter rains.* The rainfall is of course greatest on the Himalayan slopes, and

light elsewhere. In the left part of the W it is very light, and gets lighter as we go west.

Waterways.—Except the Indus and the Five Rivers (the "Punjab"), the province has no natural waterways. Hence it has to depend largely on irrigation canals. These are taken from the Five Rivers.

Irrigation.—The Punjab is the province where irrigation on the largest scale is carried on. No country in the world has such a magnificent system of canals. If we look at an irrigation map of India, we shall see that nearly the whole cultivated area of the Punjab

for the Punjab rive

rainfall, no small tr

so suited for artificial irrigation by canals are :—

(1.) The Indus and its Punjab tributaries come from the snows and ice of the Himalayas, a storehouse of water which never fails.

(2.) These rivers are spread out over the whole province like the fingers of an open hand.

(3.) The flat country and soft soil of the Punjab allow canals to be dug cheaply from these rivers.

(4.) The alluvial soil, though thirsty, is rich, and therefore, if water can be brought to it, the cost of the canals can be soon repaid by large crops.*

The principal perennial canals in the Punjab are (1.) the Jhelum Canal; (2.) the Chenab Canal; (3.) the Bari Doab Canal ("Bari" is a compound of the two names Beas and Ravi); (4.) the Sirhind Canal; (5.) the Western Jumna Canal. Besides these, there are many small inundation canals, which draw off water from each of the Five Rivers, and from the Indus, when they are in flood during the hot weather.

The irrigation works on the Punjab rivers have naturally increased the productions and the population of certain districts. The area irrigated by the new canals is equal to the whole cultivated area of Egypt. In the Rechna Doab a piece of desert has been turned i

farms and villages into which

is called the

Soil and being on the whole

an alluvial ut in the south-west

* The Chenab Canal cost over 2¾ crores of rupees to make, but by its means crops worth more than 3½ crores are raised annually.

there are dry, sandy plains, and over the western half the want of rain makes much of the land useless for cultivation. Owing to its deficient rainfall the Punjab produces little in proportion to its large area. Its cold weather suits *wheat* and *barley*, which are largely grown. These are its main crops, but almost all Indian products are grown to some extent—for example, *millets* and *pulses*, *sugar-cane*, *cotton*, and *rice*. *Tea* is grown in the Kangra district in the Himalayas.

Race, Language, and Religion.—The people of the Punjab are *nearly pure Aryans in race*. The *Mohammedans outnumber the Hindus*, and there are also many Sikhs. An Aryan language, *Punjabi*, is spoken.

The Punjab, including the native states, has a population of over twenty-four millions. It is thickest in the fertile districts of the north and east, and is very thin in the dry tract in the south-west. Owing to the poverty of much of the soil the percentage of rural population is comparatively low. The population of the Punjab decreased from 1901 to 1911.

Cities and Towns.—We have seen that the western half of the Punjab (the left half of the W) is partly desert, and much less fertile than the eastern half. There are, therefore, few towns in the western half, and these few are either military defence posts or centres of trans-frontier trade There are three large cities, all in the fertile eastern half.

Lahore (228) stands on the Ravi, near the centre of the province. When, at the close of the Sikh Wars, it came into the hands of the British, a great part of it was in ruins; but during the last thirty years it has been growing fast. Yet Lahore has few manufactures beyond the making of gold and silver lace, and a little cotton spinning. It is important as being the capital of the province, the seat of the Punjab University, and a railway centre.

Delhi (233) on the Jumna, stands at the point which invading armies from the north-west, avoiding the desert, would naturally fix upon as their permanent camp, for it is the first place to be reached from which they could command the rich plains of the Ganges. Thus the position of Delhi explains why the fate of India has thrice been decided in its neighbourhood—at Panipat. If a man were to write the story of Delhi, he would find when he had finished that he had written the history of India. Delhi is the greatest historical city in India. The present city is built on the

ruins of several old Delhis, but its buildings date from the times of the great emperors Shah Jahan and Auranzeb. Delhi, the old Moghal capital, is still the city which the people of India look upon as the capital of India, and here the Durbars of 1877, 1903, and 1911 were held. At the last of these the King Emperor proclaimed that Delhi, and no longer Calcutta, was to be the capital. Its central position makes it a much better place for a capital than Calcutta. New buildings, streets, and roads are therefore being planned, and the Government of India will have its chief offices here in future. Like other old capitals, it has old court industries of [illegible] [illegible]d, and ivory carving, [illegible] added modern indus- [illegible] mills, iron foundries, [illegible] [illegible]ntre of business, and [illegible] Calcutta or Bombay on the one hand, and Rajputana on the other. Its Chandni Chauk bazaar is the finest business street in India outside of Calcutta and Bombay. From Delhi lines of railway run out to the Punjab, the United Provinces, and Rajputana, and it is the centre of the railway systems of North India.

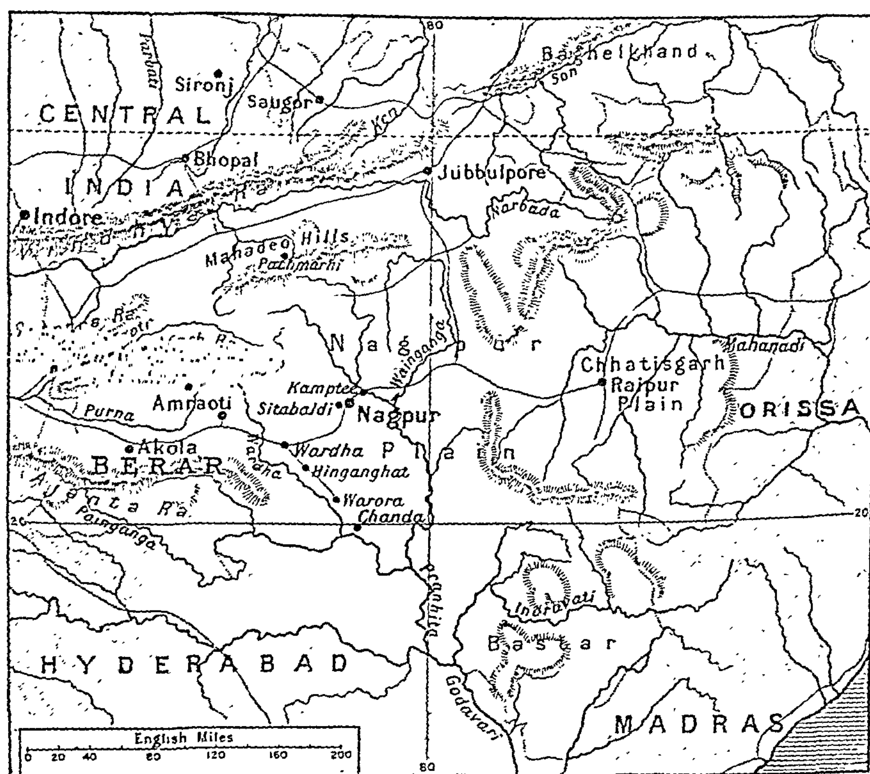
Amritsar (152) means "lake of immortality." It is the holy city of the Sikhs, built round a sacred tank. It is, besides, a flourishing city with a large trade. Its position makes it the centre through which much of the Kashmir and Afghanistan trade with India passes. The chief manufactures are Kashmir shawls, made of goats' hair, and carpets.

Other Towns.—1. Military Stations.—Till the North-West Frontier Province was formed in 1901, the Punjab was the frontier state next to Afghanistan. Hence it contains a large number of military stations where troops are held in readiness for the defence of India in the north-west. There are garrisons at *Amritsar*, and *Mian Mir*, near Lahore, and *Delhi*; also at *Ambala*, *Ludhiana*, and *Jullundur*, stations on the railway between Delhi and Lahore, and at *Sialkot* near the Kashmir boundary north of Lahore. In the north-west itself there are three important military posts—*Rawal Pindi*, *Attock*, with a fort guarding the railway bridge over the Indus, and *Peshawar*, which is now the capital of the new Frontier Province. Note that all these posts are connected by railway for the despatch of troops and guns at a moment's notice. There are no large military stations in the south-west of the province, because from that side an attack is to be met at Quetta, the military outpost in Baluchistan.

2. Trade Centres.—These are (besides the three big [illegible]

Pranhita-Godavari, which divides the Central Provinces from Berar and Hyderabad in the south-west; (2.) the line of the Narbada where it separates the province from Central India (western part) in the north-west.

Physical Aspects.—In the Central Provinces the Vindhyas and Satpuras break up into detached ranges and rugged uplands. These are continued right across the northern half



31. THE CENTRAL PROVINCES AND BERAR.

of the province to the highlands of Chota Nagpur in Bengal. Thus we have, in order, from north to south—

(1.) The table-land of the Vindhyas in the north, sloping northwards to the Ganges valley; (2.) the narrow valley of the Narbada River, which flows westwards among rocks and waterfalls; (3.) the table-land of the Satpuras; (4.) the great Nagpur plain, stretching west and east across the middle of the province, and sloping partly south in the Wardha and Wainganga valleys, and

partly east in the Chhatisgarh plain of the Mahanadi; (5.) in the south corner a wild, rugged country stretching along the left bank of the Godavari.

The Central Provinces, owing to their hills and heavy rainfall, are the birthplace of rivers. The Narbada and Tapti flow out to the west; the Wardha south-eastwards; the Wainganga and Indravati to the south; the Mahanadi to the east; the Ken and Son to the north.

Rainfall, Soil, and Productions.—"It may be said that no part of India is more free from fear of drought than the Central Provinces, where the rainfall has never been known to fail." * It averages about 50 inches. There is little irrigation, and none from canals. The Central Provinces, like Assam, largely consist of hilly country, covered with forests and jungle. Only about one-third of the country is cultivated, chiefly in the river valleys; nearly half is uncultivable waste. In the valleys there is some rich, black soil producing rice and cotton. Oil-seeds, millets, and pulses are grown on the drier soils, and wheat as a winter crop. The Chhatisgarh plain, through which the Mahanadi flows, is the "land of the threshing-floors," and grows much rice and wheat.

Race, Language, and Religion.—The people are *Dravidians* in race *Hinduism* is the prevailing religion, but there are many Animists among the hill tribes *Hindi*, *Marathi*, and a little *Uriya* are spoken, and the hill tribes speak *Gondi*, a Dravidian dialect. Owing to the large area of uncultivated and waste land, the *population is sparse*, being thickest in the valleys where rice can grow best There are few town-dwellers. The Satpura Range has been the refuge ground of aboriginal races.

Towns.—Nagpur (135), the old Maratha capital of the Bonsla Rajas, and now the seat of the administration of the Central Provinces, is situated in the west, between the Wardha and Wainganga rivers. It is a large centre of increasing trade, and since the railway between Bombay and Calcutta was made through it, its population has largely increased. **Sitabaldi**, a European station, is close to the town.

Other Towns.—Kamptee, nine miles along the railway line from Nagpur, is a modern town with a military cantonment and considerable trade. **Jubbulpore** (100) in the north, the junction of the Great Indian

* In 1899, however, the Central Provinces suffered severely from famine.

Peninsular line from Bombay and the East Indian from Allahabad, is one of the most important railway stations in India. Its population is increasing fast. Near it are the famous marble rocks on the Narbada. **Saugor** is a cantonment about 100 miles north-west of Jubbulpore. **Burhanpur** on the Tapti, at the point where it leaves the Central Provinces, was a former Mohammedan capital of the Deccan, but its manufactures of silk, muslin, and gold thread are now decayed. **Raipur,** in the Chhatisgarh plain, is an important centre of trade in lac, grain, and cotton, which has been increased by its position on the Bengal-Nagpur Railway. **Wardha, Hinganghat, Warora,** and **Chanda** are all thriving trade towns in the Wardha valley. The first three are joined by a branch railway line which runs through a fine cotton country. Wardha and Hinganghat are famous for cotton growing and spinning; Warora has mines which produce the finest coal in the Central Provinces; Chanda is in the midst of ironstone ores, but they are, as yet, but little worked.

Hill Station.—**Pachmarhi,** 3,500 feet above sea-level, in the Mahadeo Range of the Satpuras, is the seat of the Government in the hot months.

Industries.—The development of industries in the Central Provinces is slow. The sole industries of importance are the spinning and weaving of the cotton grown in the valleys. There are two important coal mines at Warora. There are few railways in proportion to the area of the provinces.

The **Feudatory States** are fifteen in number. **Bastar,** a mountainous region occupying the southern angle of the province, is by far the largest, but it is very thinly populated.

History.—After the Pindari War in 1818, certain districts, known as the Saugor and Narbada Territories, were annexed by the British from Sindhia and the Bonsla Raja of Nagpur. At the same time the British undertook the administration of the rest of the Bonsla kingdom during the minority of Raghuji the Third. When he died childless in 1853, the Nagpur Territories "lapsed" to the British Government. In 1861 the Saugor and Narbada Territories, along with the Nagpur Territories, were formed into a Chief Commissionership, under the name of the Central Provinces. In 1905, when the new province of Eastern Bengal and Assam was formed, five Hindi-speaking native states in Chota Nagpur were transferred from Bengal to the Central Provinces. On the other

hand, five Uriya-speaking states, in the eastern part of the Central Provinces bordering on Madras, were transferred to the Orissa division of what was then Bengal province.

BERAR.

Berar.—The cotton valley. [*See map* 31.]

Shape and Position.—The outline of Berar is irregular, and can be best understood by studying the map. It is surrounded by the Central Provinces and Hyderabad, except for a short distance on the west where it touches Bombay.

Boundaries.—It is separated by the Wardha from the Central Provinces on the east, and by the Painganga (for a great distance) from Hyderabad on the south.

Points for the eye to remember.—(1.) The course of the Wardha and Painganga; (2.) their point of junction near Chanda.

Physical Aspects.—Berar is a broad valley lying between the Gawilgarh Range of the Satpuras on the north and the Ajanta Hills on the south. It is really an extension eastwards of the Khandesh valley of Bombay.

Mountains.—The *Gawilgarh Range* and the *Ajanta Hills* run east and west.

Rivers.—The *Purna*, with many feeders from both ranges, drains the valley westwards into the Tapti. The *Wardha* and *Painganga* drain the upper, or eastern, end into the Godavari.

Rainfall, Soil, and Productions.—The *rainfall* is good, being between 30 and 40 inches in the valley; on the Gawilgarh Hills it is much more. The *soil* is the most important feature of Berar; its valley is covered deep with rich, black soil which is very fertile. *Cotton*, grown on the black soil, is the chief crop for export. *Millets* are the staple food crops. *Wheat* is grown as a winter crop.

Berar is the "very home of the cotton plant," and takes second place for this fibre, being only beaten by Bombay, a much larger province. For its size, it is the greatest cotton-growing country in India.

Race, Language, and Religion.—The people of Berar are, like those of the Central Provinces, of *Dravidian race*, and mostly *Hindus* in religion. The language is *Marathi*.

Towns.—There are no large towns in Berar, and its population has decreased in recent years owing to plague.

Ellichpur, in the north, unconnected by railway, is the largest town.

Amraoti, on a branch line of the Great Indian Peninsular Railway, in the great cotton centre of Berar.

Akola, near the centre of the province, is on the main line.

Industries.—In Berar the principal industries are the growing, ginning, pressing, spinning, and weaving of its chief product, cotton.

History.—Berar, or the Hyderabad Assigned Districts, has been under British administration since 1853. Under the treaty of that year the British Government undertook to maintain a military force, called the Hyderabad Contingent, for the protection of Hyderabad State. In order to provide for the upkeep of this force the Nizam *assigned* the Berar districts, while the British Government agreed to pay over to the Nizam all the surplus from the administration, after payment of the cost of the contingent. It was found, however, that the treaty provided too costly a system of administration for Berar, and that, in consequence, there was often no surplus at all. In 1902 a new arrangement was made by which the Nizam leased Berar in perpetuity to the British Government for a fixed rent of twenty-five lakhs of rupees a year, and the British Government was to administer the province as they deemed fit, and promised to make proper provision for the protection of the Nizam's dominions. Berar is now attached to the Central Provinces for purposes of administration.

THE BOMBAY PRESIDENCY.

Shape.—The Presidency of Bombay is made up of a long strip of land, nowhere more than 300 miles broad, along the western seaboard. The northern half of this strip consists of the lower valley and delta of the Indus, and of the Cutch and Kathiawar Peninsulas; the southern half consists of a part of the west coast-strip, part of the Western Ghats, and part of the Deccan behind them. [*See map* 32.]

Boundaries.—*Landward*—Baluchistan, the Punjab, Rajputana, Central India, Berar, Hyderabad, Mysore State, Madras. *Seaward*—The Arabian Sea.

Points for the eye to remember.—(1.) Cape Monze—that is the northernmost point of the coast; (2.) the boundary between Bombay and Madras—that is the southernmost point of the coast; (3.) a point on the Indus 100 miles below its junction with the Panjnad—that is the northernmost point of Sind; (4.) the north coast of the Rann of Cutch—that is the southern boundary of Sind.

Physical Aspects.—Bombay Presidency is a mixture of very different kinds of country. It may be divided into six regions, two north and four south of the Narbada.

North of the Narbada: Sind and Gujarat.—(1.) SIND lies between Baluchistan and the Rann of Cutch. Here the rainfall is very light—in some places only 3 inches in the year. A great part of Sind is therefore little better than a flat, sandy desert, the only cultivation being along the banks of the Indus, where canals are dug to carry the water of the river, when in flood, on to the land. Sind is too flat for tanks to be made.

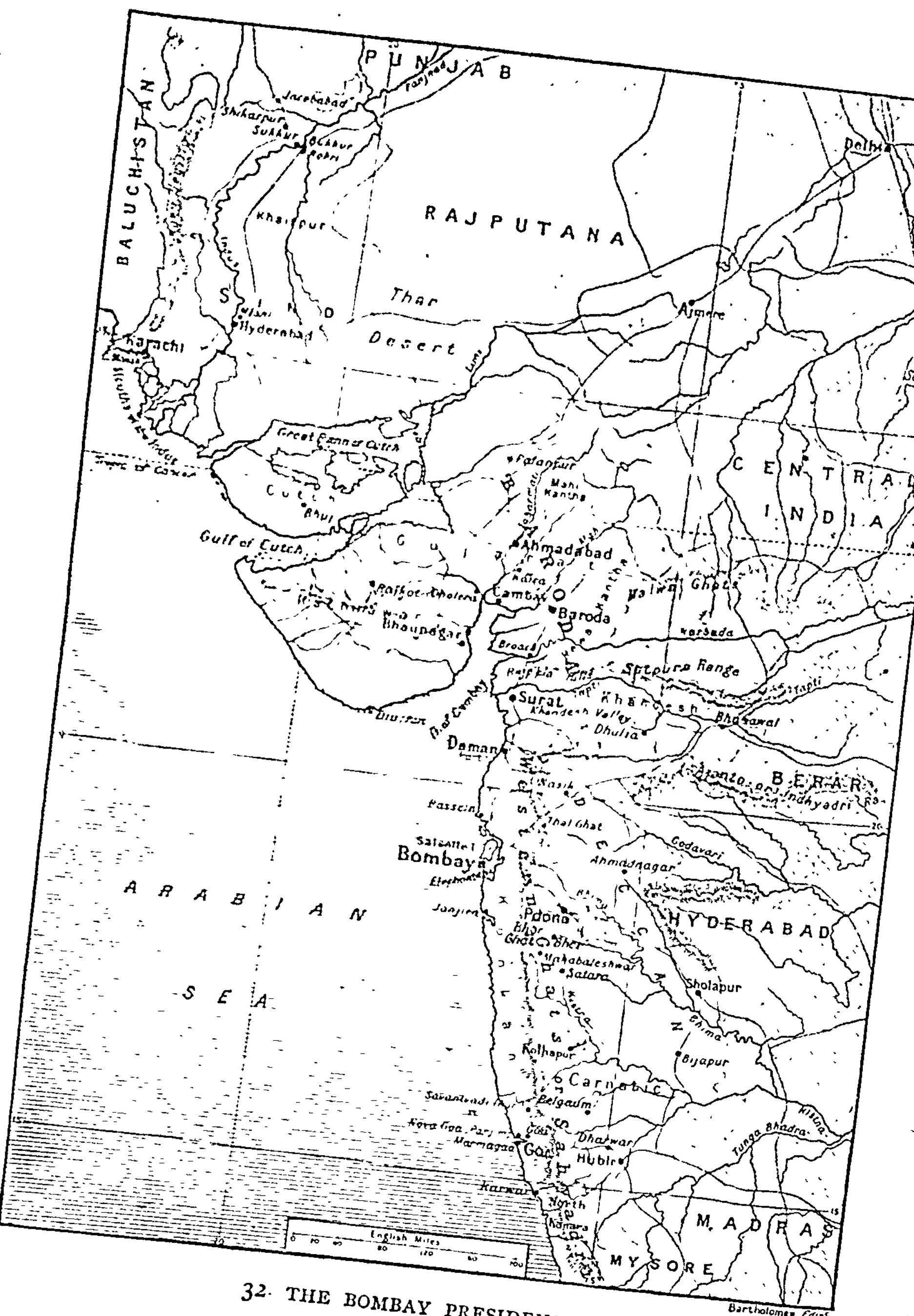
(2.) GUJARAT. This includes the peninsulas of Kathiawar and Cutch, and a broad strip of the mainland plain up to the mouth of the Luni. Gujarat consists of low-lying flat country. Near the Narbada it is very fertile, especially in the Gaekwar's territories, but as we go north the soil gets sandy, and the rainfall rapidly diminishes.

South of the Narbada: the coast-strip, Khandesh, the Bombay Deccan, and the Bombay Carnatic.

(1.) THE COAST-STRIP, between the base of the Western Ghats and the sea, extends from the Narbada down to the southernmost part of the presidency, and includes the North Konkan and South Konkan coasts, Goa (Portuguese), and North Kanara. It is a narrow coast plain, broken by numerous creeks and detached ranges of hills, but, as the rainfall is very heavy, it has rich rice lands and cocoa-nut groves.

(2.) KHANDESH—a fertile tract with rich black soil (and therefore a great cotton producing district) extending eastwards from the Western Ghats and lying between the Malwa Ghats on the north and the Indhyadri and Ajanta Hills on the south and watered by the Tapti.

(3.) BOMBAY DECCAN.—This is the long strip of elevated table-land lying behind the Western Ghats, and extending from the Narbada to the Kistna It is drained by the Tapti,



32. THE BOMBAY PRESIDENCY.

the upper Godavari, and the tributaries of the Kistna, which have strips of fertile soil along their valleys. But, on the whole, as the Ghats keep off the moisture-bearing winds from the sea, the climate is very dry for eight months in the year, and the rainfall is uncertain. The tract is therefore almost treeless, and is covered with coarse grass.

(4.) Bombay Carnatic.—This is the part of the Deccan plateau which lies south of the Kistna. The rainfall here is more certain, and the tract contains wide expanses of black cotton soil. Dharwar is the centre of a great cotton-growing district.

Mountains.—The Khirthar Range, separating Sind from Baluchistan. Part of the Satpura Range running eastward with the Rajpipla Hills as their western extremity. The Ajanta [illegible] stwards south of the Tapti. [illegible] parallel to the coast. [illegible] too narrow to have more than the beginnings or the ends of large rivers. The Indus, Narbada, Tapti, Mahi, and Sabarmati reach the sea on the Bombay coast; the Godavari and Kistna, with its tributary the Bhima, rise behind the Ghats, and flow south-eastward.

Lake.—The most important natural feature is the Rann of Cutch, already described. It is rather a lagoon, or inland sea, than a lake.

Climate, Soil, and Productions.—**Sind** is almost rainless. It depends for cultivation on irrigation from the Indus, and is very hot in summer and cold in winter. Wheat and barley are its chief crops, and are, of course; grown in winter. In irrigated parts Sind also produces large crops of red rice. Egyptian cotton also has been introduced. **Gujarat** has a warm climate, not enough rain for much rice, and some fertile black cotton soil. Hence it grows cotton, millets, and pulses, and some winter wheat. **The Bombay Deccan and Carnatic** are too dry for rice. They have some black cotton soil (especially the Carnatic); so millets, pulses, and cotton are the chief crops. The Deccan also produces enormous quantities of wheat as a winter crop. **The Konkan,** or Coast-strip, has a very heavy rainfall, and so grows two or three crops of rice, and is rich in cocoa-nut groves.

Race, Language, and Religion.—The people are of mixed Dravidian and Scythian blood. In Bombay Presidency

proper, the *Hindus* are to the Mohammedans as three to one; but in Sind they are only as one to three. Three Aryan *languages*—*Sindhi* in Sind, *Gujarati* in the northern, and *Marathi* in the southern half of the province—are spoken. Kanarese is the language of the Carnatic districts.

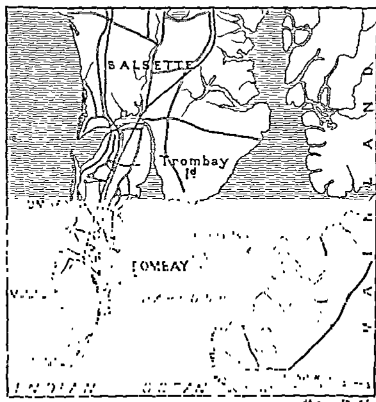
The desert of Sind and the Western Ghats take up a large part of the presidency, and the *population* is therefore sparser than that of most of the other large provinces. Bombay has suffered severely from plague in recent years. The many industrial towns have attracted a large number of people into them, and Bombay has a higher percentage of town-dwellers than any other province of India.

The **Parsis**, of Persian origin and Zoroastrians in religion, are scattered chiefly over the districts of Broach and Surat. They are very intelligent and hard-working. Half a lakh of Parsis live in Bombay city.

Cities and Towns.—**Bombay** (980), the capital, on Bombay Island, now connected with the mainland, is an example of a great town which has risen to importance by modern trade and manufactures. [*See map* 33.] The island formed part of the dowry of Catharine of Braganza, the Infanta of Portugal, who married Charles the Second of England in 1661. The king transferred it to the East India Company, who in 1684 removed the seat of the presidency to it from Surat. Since then Bombay has increased in size and importance, till it is now the second city for population in India.

Bombay owes its importance to its position on sea and land. On sea it has a magnificent harbour, protected by islands, where the largest steamers can lie in safety even at the height of the monsoon. It is nearer Europe than any large Indian port except Karachi, and it is the centre through which most of the trade of India with Europe and Africa passes. **On land** Bombay is nearer the centre of India than any other port and therefore it draws traffic from a wider inland area than any other Indian sea-port. Railways now connect it with Gujarat, the Indo-Gangetic valley, the Deccan, and the Coromandel coast. Bombay is, besides, the great cotton centre of India. It lies close to the cotton-growing districts of Gujarat, Berar, and the Bombay Deccan, and it is the chief seat of the cotton spinning

and weaving industry. One reason for this is that the damp sea-breezes favour the spinning and weaving of cotton. In places where the air is very dry the cotton fibres are apt to become over-twisted. Bombay Presidency spins about three-quarters of all the cotton yarn, and weaves more than three-quarters of all the cotton cloth made in India, and



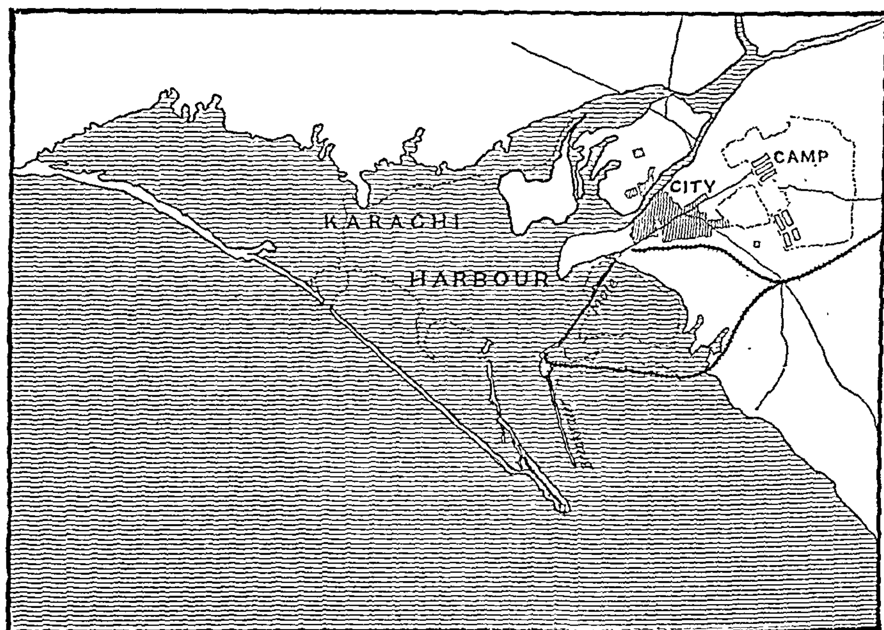
33. BOMBAY ON ITS ISLAND.

these are chiefly manufactured in the mills of Bombay city. Unfortunately there are no coal mines near Bombay as there are near Calcutta. A great deal of this Bombay yarn and cloth is exported to African ports, the Straits, China, and Japan.

In former days, when the trade of Europe was carried round the Cape of Good Hope, Calcutta was practically as near to London as Bombay was, but, since the opening of

the Suez Canal in 1869, Bombay has been brought nearer to London than Calcutta is by several days' steaming.

Bombay lies on the coast-strip, cut off from the interior by the Western Ghats; but this disadvantage has been overcome by railways north-eastwards over the Thal Ghat, and south-eastwards over the Bhor Ghat, with the result that the trade importance of Bombay has enormously increased. After 1896 the city suffered severely from plague,



34. KARACHI AND ITS HARBOUR.

but its population has lately increased. In 1891 it was the largest city in India (excluding suburbs), but it is now only second to Calcutta. The city has some of the finest buildings in India, and is the seat of a University. In Bombay harbour is the island of Elephanta, with famous cave temples.

Karachi (151), at the extreme west end of the Indus delta, is a good example of a modern town which has sprung up into importance under British rule. [*See map* 34.] It is neither an old capital nor the centre of manufactures. It only dates from 1843, when Sind was annexed, and it became the capital instead of Hyderabad. But during the last forty

years, owing to the opening of the Indus Valley Railway and the great increase of irrigation in the Punjab, Karachi has made an enormous advance. Its population, for example, has more than doubled during that time, and it is already the fifth seaport of India and Burma, and will probably soon beat Madras for fourth place.

The reasons for the importance of Karachi are—

(1.) It has a good natural harbour, which has been greatly improved, and which admits the largest ocean steamers.

(2.) It is the sea-outlet for the trade of the Indus valley and the traffic from across the North-West Frontier.

(3.) It is the nearest Indian port to Europe.

(4.) It is the harbour from which troops from England can be most easily and quickly sent to the North-West Frontier in case of a threatened invasion.

Karachi is the great port for shipping the wheat crops of the Punjab to all parts of the world. After a good wheat-harvest, Karachi harbour can scarcely hold the steamers waiting for cargoes to Europe. The disadvantage of Karachi lies in the fact that behind it stretches a comparatively barren and poor country, and the Indus scarcely helps it at all: it has only become important since the railway connected it with the more [illegible] beyond the deserts of Sind and [illegible] never, as a seaport, hope to ri[illegible]-outlet for one of the most fertile valleys in the world.

Ahmadabad (215), on the Sabarmati, was the capital of the Mohammedan state of Gujarat, and, three hundred years ago, was one of the most splendid cities of India, manufacturing articles made of silk, cotton, silver, gold, steel, and wood, required at the court of a great capital. According to the old saying, "the prosperity of Ahmadabad hangs on three threads—silk, gold, and cotton." In modern times these manufactures have somewhat declined, though they still support a large part of the population. But in addition to them, there are now steam mills for spinning yarn and weaving cotton, besides leather and paper-making works. Ahmadabad is also an important railway centre of the "Garden of Bombay." Its size and population are therefore rapidly increasing.

Surat (114), on the Tapti, was, one hundred and fifty years ago, the pilgrim port for Mecca, the chief export and

import centre of India, and probably its most populous city. It was the first English settlement, and a great cotton port. In modern times its population has gone down, and its trade has been transferred to Bombay.

Poona (155), the ancient capital of the Maratha Peshwas, and the seat of the Bombay Government during the rainy weather, stands above the Ghats, 1,800 feet above sea-level, in the Bombay Deccan. It is a large military station, and a Brahmin educational centre.

Baroda (100), the capital of Baroda State and of the Gaekwar of Baroda's dominions, east of the head of the gulf, is the second city of Gujarat and the third in the Presidency. It is a good example of an old Maratha capital, with a palace and gardens, an arena for elephant fights, the houses of bankers and jewellers (who formerly lived on the expenditure of the court), a mass of mean and over-crowded houses, and many Hindu temples. In recent times modern buildings, such as the State Library, public offices, hospitals, and the Baroda College, have been built. Baroda has few modern industries, and during the last twenty years its population has decreased.

Other Towns.

(1.) **On the Gulf of Cambay.—Daman** (Portuguese), **Broach** (near the mouth of the Narbada), **Bhaunagar, Cambay** (in Cambay State, at the head of the gulf), **Diu** (Portuguese), are, like Surat, ports which have seen better days, and are now only suitable for small craft owing to the silting up of the gulf caused by strong currents and tides. **Dholera,** formerly a cotton mart, is now several miles inland.

(2.) **Inland from the Gulf.—Dhulia** is the chief town in Khandesh district; **Rajkot** has a celebrated college for the education of sons of the Kathiawar chiefs. **Bhuj,** now reached by a railway, is the capital of Cutch State.

(3.) **On the Konkan coast.—Marmagao** (Portuguese) and **Karwar** (protected by some islets) have good harbours, but they cannot compete with Bombay, and have lost much of their trade importance.

(4.) **In the Deccan—Ahmadnagar** and **Bijapur** are capitals of old Mohammedan kingdoms which became independent. **Bhusawal,** owing to its position on the Tapti and at the junction of two main railway lines, is a place of growing trade.

(5.) **In the Bombay Carnatic.—Sholapur, Hubli,** and **Dharwar** are thriving towns engaged in growing or manufacturing the cotton for which this part of the country is famous. **Dharwar** has gold mines on an extension of the reefs worked at Kolar in Mysore State. **Belgaum** is also a cotton town, and a military station.

Peninsula "teems with native chiefs," *most of them Hindus*, but a few Mohammedan. There are one hundred and eighty-eight separate chiefships. The young chiefs are educated at the Rajkot College. CAMBAY, at the head of Cambay Gulf, is a small state. The other states in Gujarat are grouped round the PALANPUR, MAHI KANTHA, REWA KANTHA, and SURAT AGENCIES.

3. *In the coast-strip of North and South Konkan.* JANJIRA and SAVANTVADI are the chief states.

4. *In the Bombay Deccan.* The largest state is that of BHOR. The SATARA JAGIRS, which were originally under the Raja of Satara, passed under the suzerainty of the British when the Raja of Satara died without heirs and his state "lapsed" in 1849.

5. *In the Bombay Carnatic.* There are several Maratha states, of which KOLHAPUR is the largest. The Raja of Kolhapur is a descendant of Sivaji.

History.—The first English factory in India was founded at Surat in 1613. In 1668 Charles the Second transferred to the Company the island of Bombay, which he had received as part of the dowry of his wife, Catharine of Braganza. By the treaty of Salbai, at the end of the first Maratha War, in 1782, four islands, including Salsette and Elephanta, were handed over to the British by the Marathas. The treaty of Bassein in 1802, and the second Maratha War which immediately followed it, resulted in the acquisition by the British of the districts of Surat, Broach, and Kaira, and the establishment of their influence in Gujarat. By the third Maratha War, which ended in the final downfall of the Peshwa, the greater part of the present area of Bombay Presidency was acquired by the annexation of the Bombay Konkan, Deccan, and Carnatic districts. In 1843 the province of Sind was conquered and annexed by Sir Charles Napier. In 1839 the small but important settlement of Aden, in Arabia, was captured by two British men-of-war, and it is now the centre of a fairly large protectorate, including Perim, administered by a Resident, subordinate to the Governor of Bombay. In 1862 the district of North Kanara, on the coast, was transferred from Madras to Bombay.

THE MADRAS PRESIDENCY.

Shape.—If we cut off the end of the peninsula by a sloping line drawn from the Chilka Lake, along the Kistna and Tungabhadra, to the southernmost part of the Bombay Presidency on the opposite coast, and then cut out Mysore State and Coorg, we have the Madras Presidency. [*See map* 35.]

Boundaries.—North of this line ... border Bihar and Orissa, the Central Provinces, Hyderabad, Bombay. On all other sides lies the sea.

Points for the eye to remember.—(1.) The Chilka Lake; (2.) the line of the Kistna ... (3.) the southernmost point of the Bombay ... on the west coast; (4.) the Nilgiri Hills, where the ... Western Ghats meet.

Physical Aspects:—

1. The East Coast Plain ... Chilka to Cape Comorin ... coast from Lake running back from ... of plain country includes the deltas ... The northern part ... Ghats. It Lake, is called ... and Kaveri, which is much broa... Chilka to Cape Comorin ... part, Madras Presidency ... Kistna delta

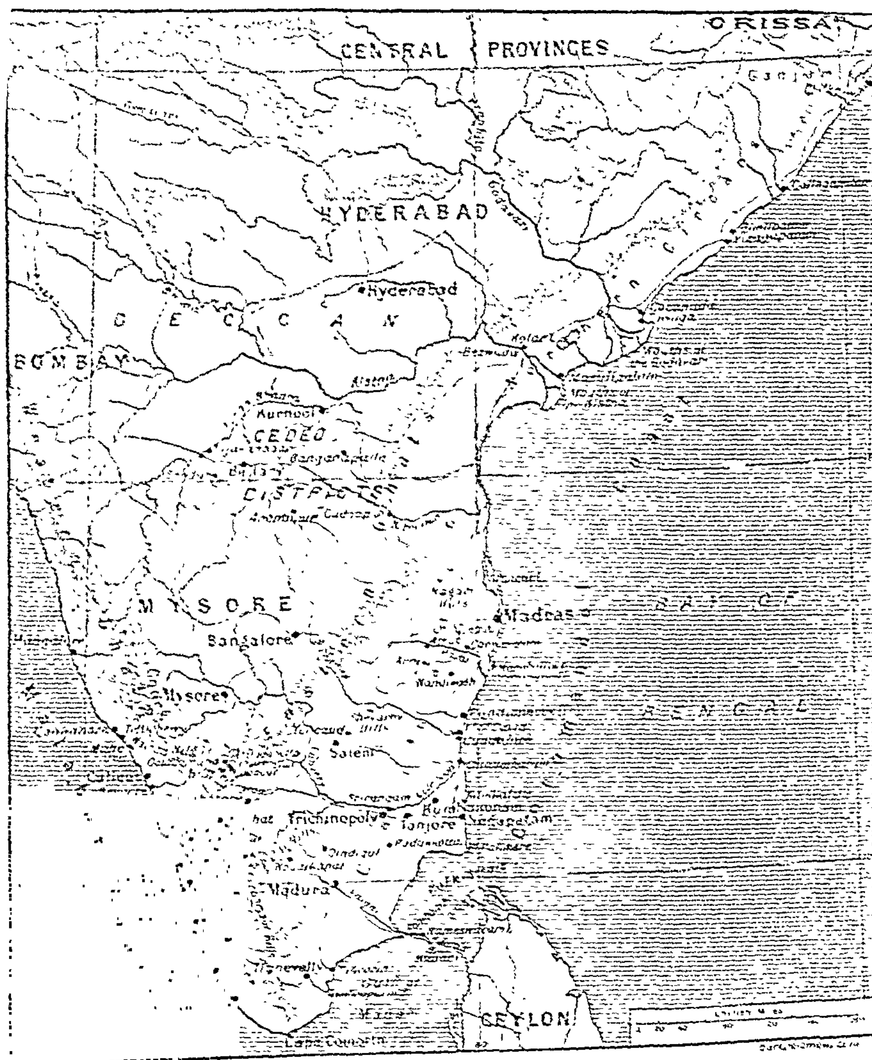
2. The West Coast-strip ... coast of the the west coast to Cape ... between them an... Ghats run down is a continuation ... narrow strip

3. Madras Deccan ... between them, ... Coast, and of the Deccan ta... (and lying

Mountains.—The ... down the western ... a small bit they are met by the ... in the grass-covered ... the highest peak is Do... ... feet. ... is a break in the ... forms a pass between ... south of the ... high and over 20 miles ... Gap, which then rise again into the ... 8000 feet mountains, the loftiest peak ... the highest point of Southern India ... and farther south the

Western Ghats, here called the Cardamom Mountains, broaden out into the SERUMALAIS and PALNI HILLS.

The Eastern Ghats are really a continuation of the Chota



35. MADRAS PRESIDENCY.

Nagpur highlands. They run roughly parallel to the coast till nearly opposite Madras, where they slope inland to meet the Western Ghats in the Nilgiris. They give off some broken ranges, of which the NAGARI HILLS, near Madras, and the SHEVAROYS, near Salem, are the best known.

Rivers.—These are the GODAVARI, KISTNA, NORTH PENNER, PALAR, SOUTH PENNER, KAVARI, VAIGAI, TAMBRAPARNI. They have been described under the rivers of the Deccan. The Godavari and Kistna are Madras rivers only for the last part of their course. These two rivers, along with the Kavari, are by far the most important on account of their fertile deltas. None of the rivers in Madras are of any value for navigation, though the Godavari has boat traffic in the wet season.

Lagoons.—The KOLAR LAKE lies between the deltas of the Godavari and Kistna, and is connected with the sea by a tidal creek. PULICAT LAKE, a stretch of shallow, brackish water, connected with the sea and the Buckingham Canal, lies north of Madras town, and is of little commercial importance.

West Coast Backwaters.—On the Malabar and Travancore coasts there are long shallow lagoons connected with the sea by channels. They extend along the coast for over 200 miles, and are much used for boat and canoe traffic, which here consists of cocoa-nuts, copra, coir, spices, and rice.

Islands.—The LACCADIVE ISLANDS are not geographically connected with India or Madras, but they are under the Collector of Malabar District. RAMESWARAM ISLAND, separated from the mainland by Pamben Passage, is famous for a Hindu temple.

Climate and Rainfall.—*Madras, being situated in the* southern part of the peninsula, has a very hot climate, and can produce all the crops grown in India, except wheat and barley, which thrive best in the cold weather of Northern India. The *Travancore and Malabar Coast* gets the full benefit of the summer monsoon There rain never fails, and two or three crops are reaped The *Northern Circars* look for most of their rain to the summer monsoon. The *Carnatic* receives its chief rainfall in the winter monsoon, but gets showers in July, August, and September sufficient to prepare the ground and start the crops. The *Ceded Districts* in the Deccan get very little rain from either monsoon, and often suffer from drought.

Products of the Plains.—*Rice* requires much water, and so is grown—(1.) in the Godavari, Kistna, and Kavari deltas; (2.) on the west coast, where the rainfall is over 100 inches; and (3.) *under tanks throughout the* Presidency, where water can be stored in hollows of the ground. The Madras Presidency is pock-marked with tanks. *Millets* (cholam and kambu), *ragi*, and *pulses* grow where there is not enough irrigation for rice; *indigo*, *sugar-cane*, *spices*, and *oil-seeds* (especially gingelly and ground-nuts) on good soil; *cotton*

is grown chiefly on the black cotton soils of Tinnevelly, Coimbatore, and Bellary; *tobacco* in the Madura and Coimbatore districts, and in the "lankas" or islands on the Godavari. *Jute* is beginning to be cultivated in the Northern Circars.

Of the Hills.—*Tea* on the Nilgiris, Anaimalais, and Palnis: *coffee* on the lower ridges of the Western Ghats, in the Nilgiris and Shevaroys, the Wynaad, and Travancore; *cinchona* on the Nilgiris; *pepper, cardamoms, teak, ebony,* and *sandal-wood* on the Western Ghats, especially on the Travancore part of them.

Of the Seashore.—*Cocoa-nuts,* which like moisture and a smell of the sea, are common all along the coast, especially on the south and west facing the south-west monsoon.

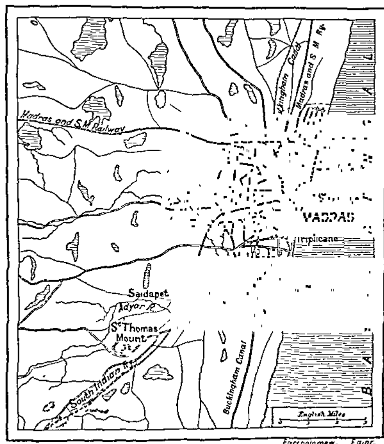
Of the Sea.—The channel between the southern coast and Ceylon is shallow, sandy, and but little disturbed by storms. It is therefore very suitable for the growth of the oyster shell-fish, from which pearls are obtained. Pearl-fishing is a thriving industry on the shores of the Manaar Gulf.

Race, Language, and Religion.—The people are of *Dravidian race,* and speak Dravidian languages—namely, *Tamil* in the south, *Telugu* in the north, and *Malayalam* on the west coast. Nearly nine persons out of ten are *Hindus;* there are comparatively few Mohammedans, for this part of India was never permanently occupied by them. Madras, including its native states, contains nearly two-thirds of all the *Christians* in India. The *population is dense,* especially in the east coast deltas and in Malabar, but not so dense as in Bengal and the United Provinces.

Cities and Towns.—The chief centres of population in Madras Presidency are either on the coast or on the fertile areas irrigated by the Godavari, Kistna, and Kavari rivers and by the Periyar scheme.

Madras (519) is the third largest city in India. [*See map* 36.] It was founded in 1639 when the East India Company obtained a grant of land on which a fort and factory were built. Round this grew the business part of Madras ("Black Town," now called George Town in memory of the visit of George, Prince of Wales, in 1906) and several villages now connected with it by roads and streets. For this reason, and

because it has plenty of room to expand, Madras is less crowded than Bombay or Calcutta, and this explains why it has been called "the city of magnificent distances." In modern times it has become the terminus of four railway lines (to Bombay, Tuticorin, Calicut, and Calcutta); a



36. MADRAS CITY.

harbour has been built, and the Buckingham Navigation Canal connects it with Bezwada and the Kistna delta. Though the third city of India in size and importance, Madras cannot compare with Bombay or Calcutta as an industrial or trade centre. In the first place, its harbour is not a storm-proof shelter for ships, and is apt to silt up;

condly, it has to compete against many small seaports on oth the Coromandel and Malabar Coasts: even the raw cotton, tea, coffee, spices and ground-nuts of the Madras Presidency are largely shipped from other ports in it. Thus Madras is quite unlike Calcutta, Rangoon, or Karachi, which, by their geographical position at the sea-outlet of great valleys, have almost a monopoly of the export and import trade of their provinces. Thirdly, Madras has not, like Calcutta, Bombay, or Karachi, a province behind it which produces large quantities of the things which foreign countries want, such as wheat, jute, cotton, opium, and rice: nor is it a city which manufactures, on a large scale, cotton yarns and cloth (like Bombay), or jute (like Calcutta). It is not surprising, therefore, that only some five per cent. of the foreign trade of India passes through Madras and that it is being beaten by the much younger seaports of Karachi and Rangoon. At these places and at Bombay the harbour has been the parent of the town, but at Madras the town has been the parent of the harbour. Madras may thus be said to owe its importance not so much to trade as to its being the capital of a large presidency and the seat of a university, though, of course, its harbour, railways, and a few local industries also help. The observatory at Madras keeps the time for India and Ceylon: the clocks at all railway stations are regulated from it.

Madura (134), on the Vaigai, one of the oldest towns of South India, was the capital of the ancient Pandyan kingdom. It is also a great religious centre. The great temple, with its "hall of a thousand pillars," elaborately carved, is the chief building. Thus "from time immemorial Madura has been both the political and religious capital of the extreme south." Madura has several small industries, such as the making o brass vessels and turban cloths. Its population has mo than doubled during the last thirty years, owing to the i provement in the district produced by the Periyar irrigati scheme. (See p. 71.)

Trichinopoly (125), on the south bank of the Kavari' at the head of its delta, is an important railway centre. rock, nearly 300 feet high and crowned with a small sh is a landmark for miles. The town is built round the and is famous for *swami* silver work, and the manuf of the well-known "Trichinopoly cheroots." Quite c

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Other Towns: Inland.—**Tanjore**, in the Kavari delta, is the centre of a rich rice country. It is an old capital with a famous temple, and jewellery manufactures. **Salem**, at the foot of the Shevaroys, is an important agricultural centre, formerly celebrated for iron mines now no longer worked. **Bezwada**, at the head of the Kistna delta, is a railway junction and a thriving town. **Bellary**, in the Madras Deccan, is a military station. **Dindigul** (famous for a cigar factory) and **Tinnevelly** are on the railway to Tuticorin, south of Trichinopoly. **Coimbatore**, near the foot of the Nilgiris, on a branch line, is an agricultural centre, with a Government farm and a college of agriculture.

Coast Towns—Along both coasts are many small seaports engaged in the coasting trade. *On the east*, from north to south, are Calingapatam, Bimlipatam, Vizagapatam, Cocanada, Masulipatam, Pondicherry (French), Cuddalore, Negapatam, and Tuticorin. **Calingapatam** and **Cocanada** have good roadsteads. The latter town is absorbing the traffic of the rich Godavari and Kistna deltas, and has nearly trebled its population in the last thirty years. At **Pondicherry** French steamers call chiefly to export the ground-nuts of the neighbouring districts to Marseilles. **Negapatam** is the port for steamers to Rangoon and the Straits Settlements. **Tuticorin**, the terminus of the South Indian Railway, is the chief port for the Ceylon and Colombo trade, with a large passenger traffic in coolies for the Ceylon tea-gardens. *On the west*, from south to north, are Quilon (in Travancore State), Cochin, Beypore, Calicut, Tellicherry, Cannanore, and Mangalore, which ship the cocoa-nuts, coffee, and spices of the coast to Bombay, Colombo, and Europe. **Cochin**, helped by backwaters, is the chief port on the Malabar coast. **Calicut**, where Vasco da Gama landed in 1498, gave its name *Calico* to the cloth introduced by the Portuguese into Europe. The railway from Madras, through the Palghat Gap, here strikes the west coast, up which it has been taken to Mangalore.

Note.—Not one of these places is a real seaport; a few can take in small sailing vessels in fair weather. Owing to the shoal water along the coasts, ocean steamers have always to lie some miles off shore, in "roads" or anchorages.

Temple Towns.—The Carnatic coast was less ravaged by Mohammedans than the rest of India, and that is why so many fine specimens of Hindu temples are to be found here. The whole of the Carnatic between Madras and Tuticorin is a country of Hindu temples. Those of **Madura, Trichinopoly, Tanjore** are the most famous, but **Conjeeveram** (Kanchi), **Chidambaram, Kumbakonam, Rameswaram** (on the island of that name), and many other smaller places, are visited

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crowds of pilgrims every year. Being temple towns, they are hmin, and therefore educational centres. On the seashore at habalipur, a day's sail down the Buckingham Canal south of adras, are the famous Seven Pagodas, solid rock-cut temples with nskrit inscriptions. They are now quite deserted.

Hill Stations.—**Ootacamund, Coonoor** and **Wellington,** on the Nilgiris: **Kodaikanal,** on the Palnais; **Yercaud,** on the Shevaroys. **Ootacamund** ("Ooty") is the finest hill station in India. It lies over 7,000 feet above sea-level, and enjoys a temperate climate. In December and January water freezes over night. It is the summer residence of the Governor and his Council. **Coonoor** has a cordite factory worked by a mountain waterfall, and a hospital for patients bitten by mad dogs. **Wellington,** is a sanatorium for soldiers. **Kodaikanal** has an observatory for the study of sun-spots.

Historical Towns.—**Madras, Trichinopoly, Arcot** (70 miles inland from Madras), **Pondicherry, Fort St. David** (in ruins), near Cuddalore, are famous for their sieges during the wars of Clive and the French. The field of **Wandiwash** lies near Conjeeveram. On the right bank of the Tungabhadra, in Bellary district, can still be traced the magnificent ruins of **Vijayanagar,** the old Hindu capital, whose rajahs made war on the sultans of the Deccan.

Industries.—Madras has many industries. The preparation of cotton (pressing, spinning, and weaving), indigo, oil, tobacco, rice (husking), leather (tanning), and sugar are the main ones. The making of salt and the curing of fish also employ many hands. Handloom weaving is the most important domestic industry, but it is declining.

Native States.—These consist of two important territories, Travancore and Cochin, on the west coast, and three small chiefships isolated amid British territory—namely, Puddukottai, Banganapalle, and Sandur.

Travancore occupies the southernmost part of the wet Malabar coast between the Arabian Sea and the Western Ghats. It consists of (1.) a fertile strip of flat coast intersected by backwaters, where rice and cocoa-nuts are the chief crops; (2.) a hilly region inland, where teak, cardamoms pepper, and coffee are largely grown. In Travancore, whic has always been cut off from the rest of India by the Weste Ghats, and which boasts that it has never been und Mohammedan rule, the old customs of Hinduism still rem unbroken, and caste rules are very strictly kept. It recently been connected with the rest of the mainland b line joining Quilon with Tinnevelly on the South Indian

way. The state is well governed, and a large proportion of the people is educated. There are many native Christians.

Towns.—**Trivandrum**, the capital and largest town, doubled its population in the ten years 1891–1901. It is an example of a town which has grown round a sacred shrine and the fort and palace of its ruler.

Quilon, formerly one of the chief ports of the west coast, may revive as it is now the terminus of the railway from Tinnevelly. **Alleppey** is the chief port of Travancore and a depôt for forest produce, especially coir.

Cochin, a smaller state to the north of Travancore, has also a coast-strip and a mountainous interior, with a climate and productions like Travancore. It has also been recently connected with the rest of India by railway. A branch line from Ernakulam now meets the Madras Railway which runs from Madras to Calicut, through the Palghat Gap. Cochin is, like Travancore, a well-governed state, with a large educated population.

Towns.—The capital is **Ernakulam**, on a backwater. Cochin, the chief town and seaport, is British territory, forming part of the Malabar District of Madras, and was acquired from the Dutch in 1795.

Note.—All along this coast the cocoa-nut palm grows abundantly. The trade of these states, therefore, chiefly consists of its products, viz., copra, coir, coir-mats, nuts, and oil. From the hills come tea, pepper, cardamoms, teak and coffee. More than half the trade is carried by backwaters to Cochin town, which some day may have a fine harbour.

PUDDUKOTTAI lies near Trichinopoly. BANGANAPALLE and SANDUR are in the Ceded Districts.

History.—The first bit of territory in the presidency acquired by the Company was the site of Fort St. George in Madras city, which was obtained from a petty raja in 1639. In 1763 the tract of country round Madras (now Chingleput District) was granted by the Nawab of the Carnatic. In 1765 the Northern Circars, comprising all the coast-strip north of the Kistna delta (the present districts of Ganjam, Vizagapatam, Godavari, and Kistna), were ceded to the Company by Shah Alam at the same time as he granted them the *diwani* of Bengal. In 1792, at the close of the third Mysore War, Tippu Sultan gave up the districts of Malabar,

Salem, and part of Madura. In 1799, after the last Mysore War, the Company took the west coast-strip of Kanara, Coimbatore, and the Nilgiris. In the same year the Raja of Tanjore resigned his territories, and in 1800 the Ceded Districts of Anantapur, Kurnool, Bellary, and Cuddapah were "ceded" by the Nizam to pay for the upkeep of a subsidiary force. Lastly, in 1801, the Nawab of the Carnátic resigned the remainder of his vast territories, extending from the Kistna to near Cape Comorin, into the hands of the British. In 1862 the northern half of Kanara (North Kanara District) was transferred to the Bombay Presidency.

COORG.

Coorg is a small state lying to the south-west of Mysore, and forming a very rugged and hilly part of the Mysore plateau. The chief town, MERCARA, little more than a village, is nearly 4,000 feet above sea-level. The climate resembles that of Mysore, but the rainfall is much heavier. Rice is cultivated in the narrow valleys, and coffee and cardamoms on the hills. One-third of its area consists of forests. The people are a fine race of hardy mountaineers.

History.—In 1834 the Raja of Coorg, who had been treating his subjects most cruelly, was deposed, and the state was, by the unanimous wish of the people, taken under British administration, and is now British territory. The state, along with the military station of Bangalore in Mysore, is administered by the Resident at Mysore.

THE ANDAMANS.

The Andamans.—The Andaman Islands, together with the **Nicobars**, lie on the eastern side of the Bay of Bengal. Geographically they belong to Burma; politically they are separated from it, and are administered by a Chief Commissioner. [*See map* 49, p. 199.]

The Andamans consist of two groups, the Great and the Little Andamans. **Port Blair**, the penal settlement to which convicts from India are sent, is on the South Island of the Great Andamans. The aborigines are Negritos, a very black and woolly-haired race of short stature, quite uncivilised. The Nicobar group, consisting of eighteen islands, is inhabited by Malays of Mongolian race. The population of the Andamans and Nicobars is about a quarter of a *lakh*.

NATIVE STATES.

RAJPUTANA.

Shape.—Rajputana resembles a roughly-drawn square with its corners corresponding to the four points of the compass. Its south-eastern side is a very broken line. *[See maps 37 and 38.]*

The point N. almost touches the Sutlej. The point E. almost touches the Jumna. The point S. almost touches the Vindhyas. The point W. is in the Great Desert.

Note.—(1.) The middle point of WS touches the Rann of Cutch where the Luni River flows into it; (2.) the Chambal leaves Rajputana at the point E; (3.) the lines WN and NE correspond to the two legs of the Punjab W.

Boundaries.—N.E. The Punjab and United Provinces. S.E. Central India. S.W. Bombay (Gujarat and Sind). N.W. Sind and the Punjab.

Physical Aspects.—Rajputana consists of two unequal parts separated from each other by the Aravalli Mountains, which run across the country from the south-west to the north-east.

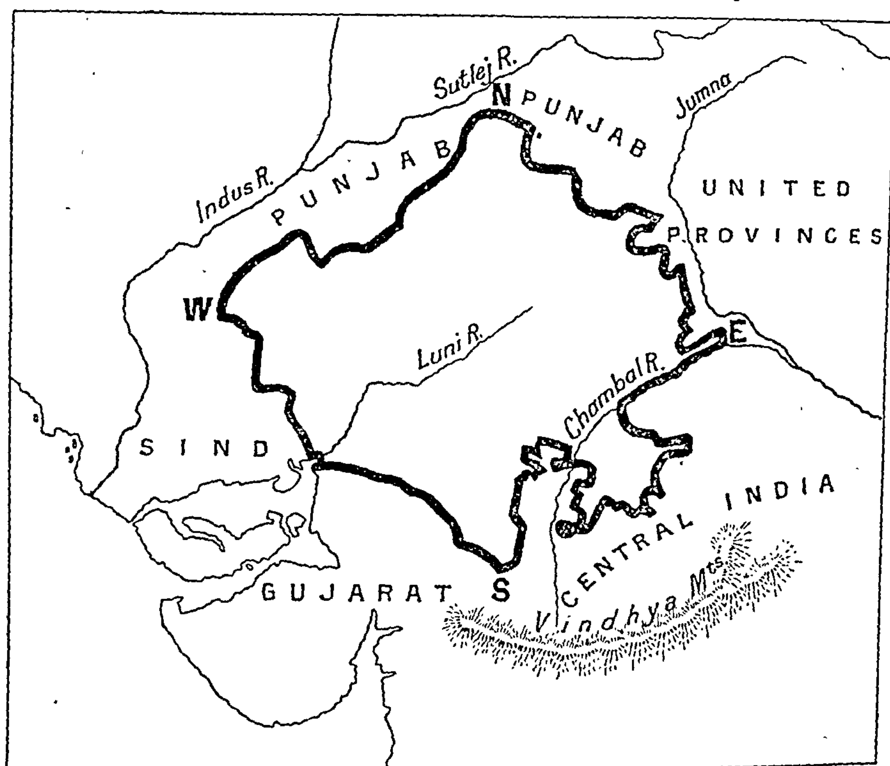
1. The part north-west of the Aravallis takes up three-fifths of the country, and, being untouched by the monsoon, is sandy, ill-watered, and unproductive. It becomes worse as we get farther from the Aravallis, and the western borders next Sind and the Punjab end in the Great Desert of THAR.

2. The smaller section (two-fifths) south-east of the Aravallis, is higher and more fertile. It consists of the western part of the Malwa plateau, is much better watered, being drained by the Chambal and its feeders, and slopes down to the valley of the Jumna.

Mountains.—The ARAVALLIS are the only mountains in Rajputana. They begin in Mount Abu (5,650 feet), on the south-west border, and stretch in a distinct range up to Ajmer; after which they are lower and more broken, but can be traced up to the famous "Ridge" under the walls of Delhi in the Punjab.

The Mahi Hills run south-east from the southern end of the Aravallis to the Vindhyas.

Rivers.—(1.) In the north-western section the Luni is the only river, draining the western slopes of the Aravallis into the Rann of Cutch. (2.) In the south-eastern section the table-land is drained by the Chambal and its feeders (the Banas left bank, Kali-Sind and Parbati right bank) from the Vindhyas into the



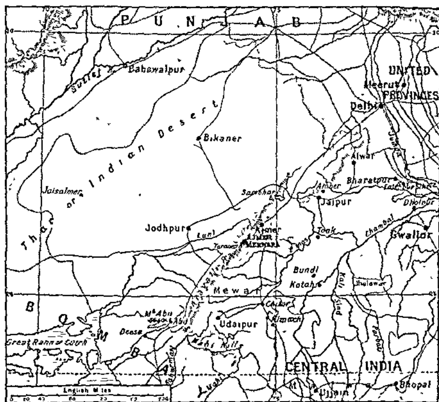
37. THE "SQUARE" OF RAJPUTANA.

Jumna. The Sabarmati and Mahi drain the south-eastern corner into the Gulf of Cambay.

Lake.—Sambhar Lake, near Jaipur, is a shallow salt lake from which thousands of tons of salt are manufactured yearly. As the lake has no outlet, the sun evaporates the water, and leaves the salt behind.

Rainfall.—Rajputana on the whole gets very little rain, and that little is uncertain. The part west of the Aravallis becomes drier as we go west into the desert, where only 5 inches fall in the year. In the part east of the Aravallis the rainfall increases as we go east, from 20 to 30 inches.

Waterways, Irrigation, Soil, and Productions.—(1.) In the north-western half the Luni is the only river; it is salt, and nearly dry except in the rains. There are few tanks, and wells have sometimes to be dug 300 feet down before water is reached. The soil is poor, and there are great tracts of sand Hence, in this half, only a single scanty crop can be



38. RAJPUTANA.

grown—namely, *millets*, in the better part of the desert land, and *wheat* or *barley* as a winter crop on the banks of the Luni. The people here, therefore, live by pasturing herds of cattle, sheep, and camels, moving about from place to place in search of fodder.

(2.) In the south-eastern half the country is more fertile, has a greater rainfall, and is better watered by rivers and tanks. Two crops can be grown—namely, millets or oil-

seeds in the autumn, wheat or barley in the winter. In favoured places sugar-cane, cotton, and opium are grown. On the whole Rajputana is a poor agricultural country, and is often visited by famine.

Race, Language, and Religion.—The Rajputs are nearly pure *Aryans*; almost all of them are Hindus, speaking *Rajasthani*, an Aryan language. Rajputana, especially the part to the west of the Aravallis, is little cultivated, and the *population* on the whole is *sparse*. Owing to the number of the towns and the poverty of the soil, the percentage of town-dwellers is large.

Towns.—In Rajputana the state takes the name of the capital, and the capital takes the name of the chief who founded it. The towns resemble each other. They are the places to which the Rajput chiefs retreated when their power in Northern India was broken by the Mohammedan invasions. They are therefore all (except Jaipur) built on sites suited for defence or refuge, usually a rocky ridge or small hill. Here the chief would build a fort, with a palace and pleasure gardens near it, and fence in his followers in the town by a strong, thick wall. There is an abundance of fine building stone and marble in Rajputana, and hence the towns, both from their position and the materials of which they are built, have a very striking and picturesque appearance. These towns have but little trade, and are maintained by the expenditure of the courts of the chiefs and their nobles. The large towns are capitals of states of the same name. Jaipur, Udaipur, Alwar, Ajmer, Jaisalmer, Bikaner, and Jodhpur are all examples of this type of city.

Jaipur (138), in the north-east, is one of the finest Hindu cities in India. It is surrounded by hills crowned with forts, with the palace in the middle. It is the centre of banking firms and of trade between Delhi, Agra, and Rajputana. Near it is the deserted city of Amber, the ancient capital.

Ajmer (British), a walled city on a plateau of the Aravallis, has two famous colleges (one of them the well-known Mayo College for Rajput chiefs), and is the residence of the British Agent. It is the capital of the small British province of Ajmer-Merwara.

Udaipur is one of the most picturesque cities in India, with a granite and marble palace. **Jaisalmer, Bikaner,** and

Jodhpur lie out on the Rajputana desert to the west. **Tonk** (the capital of a Mohammedan state), **Kotah**, and **Bundi** lie on the Banas-Chambal plateau. **Bharatpur**, on the north-east frontier, is famous for the sieges of its fort by Lord Lake in 1803, and Lord Combermere in 1827. **Dholpur**, on the Chambal, in the east, is the capital of a Jat state. **Chitor** has a famous fortress, and was formerly the capital of Udaipur. **Mount Abu**, 3,945 feet above sea-level, at the southern end of the Aravallis, has a sanatorium, and some fine marble temples built by the Jains.

History.—Rajputana is the country where the Rajputs found refuge when driven out of Hindustan by the Mohammedans. It comprises twenty states, with the small British district of Ajmer-Merwara in the middle. After the third Maratha War Lord Hastings carried out the pacification of Central India and Rajputana In 1818 most of the Rajput chiefs entered into subsidiary treaties with the British Government, by which they agreed to accept British protection and pay tribute. The chief states are Udaipur (or Mewar), Jodhpur, Jaisalmer, Bikaner, Jaipur, Alwar, Bharatpur, Dholpur, Karauli, Bundi, Tonk, Kotah, and Jhalawar. Bharatpur and Dholpur are Jat states, and Tonk is Mohammedan. The rulers of all the others are Rajputs.

Udaipur, the parent state, occupies a hilly table-land at the southern end of the Aravallis. The Rana belongs to a family which ranks first among the Rajputs of all India, and which boasts that it has never given a daughter in marriage to an Emperor of Delhi.

Jodhpur, to the north-west of the Aravallis, is much the largest state, though not the most populous, as the country is barren.

Jaisalmer and **Bikaner,** in the extreme west, are large states in the desert part of Rajputana; they occupy the most thinly populated tract in all India.

Jaipur, partly in western and partly in eastern Rajputana, lies on both sides of the Northern Aravallis. Though not the largest, it is the most populous state in Rajputana.

The other states of Alwar, Bharatpur, Dholpur, Karauli, Bundi, Tonk, Kotah, and Jhalawar are much smaller, and lie in eastern Rajputana, in the country watered by the Chambal and its tributaries. In the midst of these states lies the small

British district of Ajmer-Merwara. It is under a Chief Commissioner who is, at the same time, Agent to the Governor-General for Rajputana.

CENTRAL INDIA.

Central India, or the Central India Agency, consists of a large number of native states grouped into nine Political Agencies, under the Agent-General to the Governor-General. The Agent-General resides at Indore. [*See map* 39.]

Position, Shape, and Boundaries.—It is impossible to understand the position and outline of this part of India except by a careful study of the map. Its shape is, roughly, a long triangle, with the line of the Vindhyas and the Son as hypotenuse, the Chambal as one side, and the Jumna and Ganges as the other.

Note.—(1.) This triangle is only a very rough way of remembering the outline. (2.) No part of Central India actually touches the Jumna or Ganges.

The whole tract is divided into two parts by a narrow neck of the United Provinces, which separates the larger or western half (Central India proper) from the smaller or eastern half (Bundelkhand and Bagelkhand).

1. **The western part** comprises the eastern half of the Malwa plateau (Rajputana east of the Aravallis being the other half) lying between the Chambal and Betwa, and sloping north-east from the Vindhyas to the Jumna valley.

Its natural boundaries are therefore—**S.** The Vindhyas, separating it from the Central Provinces. **W.** The Chambal, separating it from Rajputana. **E.** The Betwa, separating it from the "neck" formed by the United Provinces. **N.** The Jumna valley, separating it from the United Provinces.

Note.—(1.) In the south-west corner the boundary goes beyond the Vindhyas, across the Narbada valley, and over the Satpuras. (2.) The triangle of land between the Chambal and Parbati (the Kotah and Jhalawar States) belongs to Rajputana.

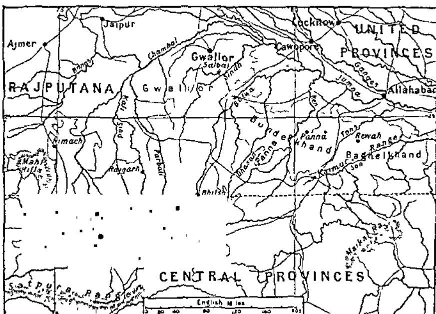
2. **The eastern part**—Bundelkhand and Bagelkhand—comprises the thin part of the triangle sloping northward towards the Jumna and Ganges valleys.

Boundaries.—The eastern part is surrounded by the United

Provinces lying on the north, east, and west, and by the Central Provinces on the south.

Physical Aspects.—Central India forms part of the hilly table-land watered by the right-bank tributaries of the Jumna and by the Son and sloping down to the Jumna and Ganges valleys.

Mountains.—(1.) *Western half.* The VINDHYAS run near the southern border, the highest peaks (2,500 feet) overlooking the



39. CENTRAL INDIA.

Narbada valley, 1,700 feet below, on the south. The SATPURAS (only for 100 miles) occupy the south-west corner, rising to 3,000 feet, and in one peak to over 5,400 feet. Part of the MAHI HILLS runs from the south end of the Aravallis to the Vindhyas.

(2.) *Eastern half.* The KAIMUR RANGE, a continuation of the Vindhyas along the left bank of the Son.

Rivers.—(1.) *Western half.* The CHAMBAL (with its right-bank feeders the Kali-Sind and [illegible]
all draining the country from [illegible]
The NARBADA. Central India [illegible]
river and its valley between the [illegible]

(2.) *Eastern half.* The DHAS[illegible]
across the slope on their way to the Jumna and Ganges.

ainfall, Waterways, and Productions.—The rainfall is l, being about 30 to 40 inches in the western, and 40 to nches in the eastern, half. Central India is well drained the eight rivers above mentioned and their feeders, but y are but little used for irrigation. The Son canals are in nar. The soil is rich, and well cultivated. Central India oduces the usual millets, pulses, and rice; wheat in the ld weather, cotton and sugar-cane.

The Malwa plateau, in the western half, is especially famous r *opium* and *tobacco*.

Race, Language, and Religion.—The people are mostly of *Dravidian stock*. *Hinduism* is the prevailing religion, and *Hindi* the prevailing language. Nearly a quarter of the population is made up of aboriginal tribes, *Gonds* and *Bhils*, in the Satpura Hills. These are largely *Animists*, and speak *Dravidian dialects*.

Towns.—WESTERN DIVISION (Central India proper).

In Gwalior State.—**Gwalior** (89), the capital and centre of the Maharajah Sindia's dominions, is the largest town in Central India. It is famous for its rock fortress, a mile and a half long and 340 feet high; for its old palace, one of the best specimens of early Hindu architecture in India; and for its Jain temples.

Ujjain, in a detached part of Gwalior, north of Indore, is one of the most sacred cities of Hinduism. It was formerly the capital of Malwa.

Bhilsa, on the Betwa, is noted for its tobacco. Near it are temples and Buddhist topes, among which the Sanchi tope is the most famous.

Nimach (Neemuch), near the border of Rajputana, on the railway half-way between Indore and Ajmer, is a military station.

In Indore State.—**Indore** the capital, the centre of the Maharajah Holkar's territories and the residence of the Agent-General of Central India, lies north of the Vindhyas, 1,800 feet above sea-level, on the railway which strikes off to Ajmer from the Great Indian Peninsula line. Near it is MHOW, the largest military station in Central India.

In Bhopal State.—**Bhopal**, the capital, is 1,700 feet above sea-level.

EASTERN DIVISION.

In Panna State.—**Panna**, the capital, a well-built city, was formerly famous for diamonds, which were dug up near it.

In Rewah State.—**Rewah**, the capital, north of the Kaimurs, is the largest town in Bagelkhand. At Umaria, in this state, is an important coal mine.

History.—Central India is simply the name given to a group of states placed under the charge of the Agent to the Governor-General. After the Pindari or third Maratha War, when the Peshwa was dethroned and his claims of suzerainty passed to the British, the pacification of Central India was entrusted to Sir John Malcolm. His policy was to recognise all existing rights of the chiefs to territory and tribute, and to place them under the guarantee of the British Government. This explains why the geography of Central India is so confused, why some states are scattered about in detached portions; and why some of the larger states receive tribute from the smaller ones. Central India contains some one hundred and forty-three states, of which Gwalior, Indore, and Bhopal in the western half, and Panna and Rewah in the eastern half, are the largest. The states are grouped into agencies, the chief of which are Gwalior, Indore, Bhopal, and Western Malwa in the west, and Bagelkhand and Bundelkhand in the east.

HYDERABAD.

Hyderabad is the heart of the Deccan.

Shape.—Hyderabad is, roughly, shaped like a diamond *plus* a triangle in the south-west corner. *[See maps 40 and 41.]*

Boundaries.—The boundaries of Hyderabad can be best understood by studying carefully the course of the Godavari and Kistna and their tributaries. The state lies between the Godavari and its big left-bank tributaries on the one side, and the Kistna and its big right-bank tributary on the other.

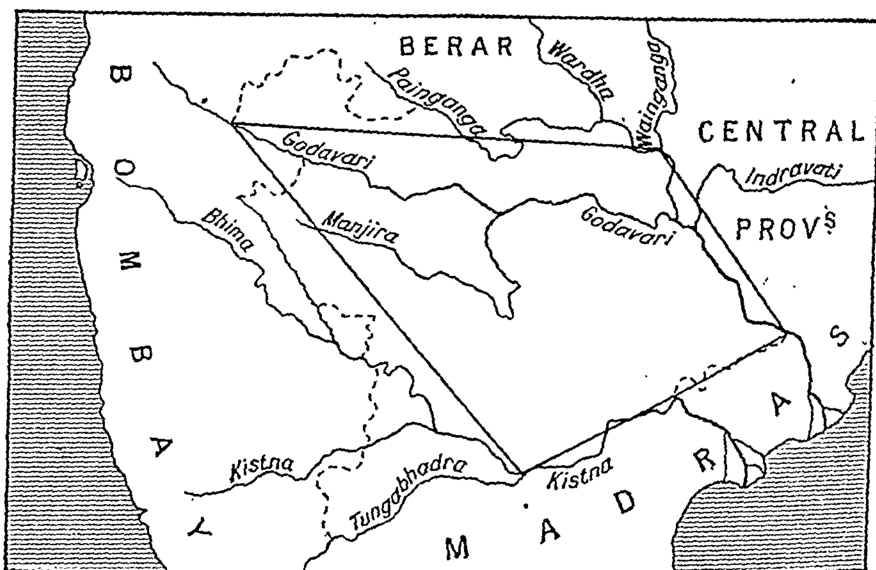
In the *north* the Painganga separates the state from Berar. In the *north-east* the line of the Pranhita-Godavari separates the state from the Central Provinces. In the *south* the line of the Tungabhadra-Kistna and the Eastern Ghats separate the state [illegible] by Bombay.

[illegible] e Godavari [illegible] join them.

Physical Aspects.—Hyderabad is a table-land averaging about 1,250 feet above sea-level, and sloping nearly north-west to south-east in the direction of the flow of the rivers. The table-land is made up of plains crossed by river valleys with ranges of hills here and there.

Mountains.—The Balaghat Range runs between the Godavari and its feeder, the Manjira.

Rivers.—The Godavari and Kistna and some of their tributaries. The GODAVARI enters Hyderabad at the most westerly point of the "diamond," and flows eastwards across the northern

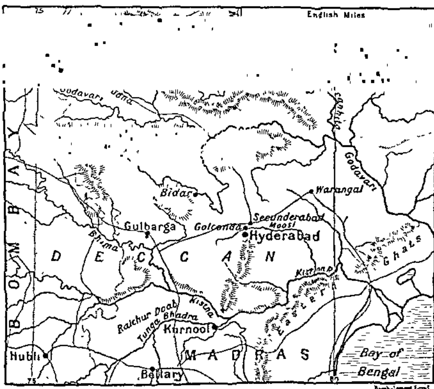


40. THE "DIAMOND" OF HYDERABAD.

half of the state. Feeders: the DUDNA, PURNA, and PRANHITA on left bank; the MANJIRA on the right. The PAINGANGA, a feeder of the Wardha, forms the boundary for some distance between Hyderabad and Berar. The KISTNA, with its left-bank feeder the BHIMA and its right-bank feeder the TUNGABHADRA, occupies the triangle on the south-west corner of the state outside the "diamond."

Rainfall and Productions.—Hyderabad has a moderate rainfall of about 30 inches, most of which falls in the summer monsoon. The numerous rivers naturally irrigate a large part of the state, and their valleys are well cultivated. There are also many tanks, but there are no canals. On the whole Hyderabad is not a very fertile country; it has

too little rain, and but little artificial irrigation. Its cold weather produces some *wheat*; *rice* is grown in the river valleys and under tanks; *millets*, *ragi*, *oil-seeds*, and *indigo* on the drier soils. Its chief crop for exportation is *cotton*; there are large tracts of black cotton soil, and Hyderabad comes next to Bombay and Berar for cotton crops.



41. HYDERABAD STATE, OR NIZAM'S DOMINIONS.

Race, Language, and Religion.—The people are mostly *Dravidians*, and almost all *Hindus*, speaking *Marathi*, *Kanarese*, and *Telugu*. The state is not very fertile, and therefore the population is thin.

Towns.—The history of Hyderabad is seen in its towns and villages. It is the part of India where the influence of settled government has always been least felt. The state itself became independent of the Moghal Empire, and in its

territories are remains of several old independent kingdoms. It is the country where the Mohammedans and Marathas fought for supremacy, and where the Pindari bands roamed and robbed. The marks of former anarchy are to be seen everywhere. Almost every town is an old independent capital, and all are protected by walls or fortresses. Even the villages have usually small forts, to which, in troubled times, the inhabitants could retire and defend themselves. There are no great centres of modern industry.

Hyderabad (500), the capital of the largest native state and the fourth most populous city in India, stands on the Moosi, a tributary of the Kistna, 2,000 feet above sea-level. It is a good example of an old-fashioned capital, with its palace and mosques, surrounded by a wall, and inhabited by a mixed population including an army of Pathans and Arabs, dependent for its livelihood on the expenditure of the court. "Perhaps there is no city in India with a population so varied or so war-like. Every man goes about armed with a weapon of some kind, while the military classes are literally armed to the teeth. Here may be seen the Arab, the Sidi, the Rohilla, the Pathan, the Maratha, the Turk, the Sikh, Persians, Bokhariots, Parsis, Madrasis, and others."

In recent years the condition of Hyderabad has much improved. The Nizam has been helped by a succession of able ministers; the Afghan police keep order in the city; large shops have been built in the bazaars; and the children, both boys and girls, are being educated. In a few years Hyderabad city will compare with Madras or Bombay.

Hyderabad in its geographical situation, its history, and its everyday life may be contrasted with a city such as Rangoon.*

Hyderabad is (1.) in the middle of a thinly-populated table-land.	*Rangoon* is (1.) on the sea-coast and near a rich delta.
(2.) An old court capital the inhabitants of which are mostly soldiers and "followers" of the palace.	(2.) A modern commercial capital full of merchants, traders, and immigrants attracted by business.
(3.) Not closely connected with the rest of the world: is not even on a main line of railway.	(3.) On a world's highway and the gateway of a rich interior.

* If India and Burma were newly discovered countries, a large town would be sure to spring up in a few years on the Rangoon

Secunderabad, six miles off, is the largest military cantonment in India; the troops keep the lawless rabble of the capital in awe.

Old Capitals.—**Golconda**, seven miles to the west, is an old capital, formerly famous for its trade in diamonds. **Gulbarga**, farther west, and **Bidar**, to the north-west, are old Brahmani capitals. **Aurangabad**, in the north-west corner, is the old capital of Malik Ambar. Near it is **Daulatabad**, or Deogarh, an ancient Hindu stronghold. **Warangal**, to the north-east of Hyderabad, was the capital of the ancient Hindu kingdom of Telingana. These are all typical towns of the Deccan.

In the north-west corner of the state two villages, **Ellora** and **Ajanta**, are famous for rock-cut temples of Jain, Buddhist, and Brahmanical art. Near them lies **Assaye**, where, in 1803, General Wellesley (afterwards the Duke of Wellington) defeated the Marathas.

History.—The dynasty of the Nizam and the kingdom of Hyderabad were both established by Asaf Jah, a Turkoman general of the Moghal emperor Aurangzeb. In 1713 he was appointed Subadar or Governor of the Deccan, with the title of Nizam-ul-Mulk (Regulator of the State). As the Moghal Empire, after the death of Aurangzeb, was, owing to internal quarrels and the attacks of the Marathas, tottering to its fall, Asaf Jah easily asserted his independence, and at the time of his death, in 1748, he was firmly established in it, with a kingdom roughly the same as the present state. The title of Nizam has become hereditary in his family. The relations of the state with the British Government are regulated by a series of treaties, of which the first was made in 1759, and the last in 1902.

MYSORE.

Mysore is a table-land, the southernmost and highest part of the Deccan, wedged in between the converging Eastern and Western Ghats. [*See map* 42.]

Shape.—Mysore is roughly triangular in shape, with its vertex pointing south.

Boundaries.—It is surrounded on all sides by the Madras

River; but no one nowadays would *think* of building a large town where Hyderabad stands.

Presidency, except on the north-west, where it is bounded by the Bombay Presidency. For 70 miles on the south-west it touches the small province of Coorg.

Physical Aspects, Mountains, Rivers, etc.—Mysore is an undulating table-land, over 2,000 feet above sea-level, and flanked east and west by the ranges of the Eastern and Western Ghats, which send down spurs on either side. It is famous for high hills called "droogs," rising singly above the

42. MYSORE STATE.

level of the table-land. These were formerly the favourite spots on which forts were built.

Water-parting.—Running east and west across the state is a high ridge (3,000 feet) which divides the drainage of the country, one half going north into the Kistna and North Penner, and the other south into the Kavari.

Malnad and Maidan.—The people of Mysore also divide their country into the high rugged uplands of the Western Ghats (the Malnad), and the undulating and more level plains stretching eastward (the Maidan).

Rivers.—From the high land of Mysore rivers flow in nearly all directions, except to the westward, where the high barrier of the Western Ghats prevents them.

...—The TUNGA and BHADRA (forming the Tunga-
the Kistna. The NORTH PENNER.
SOUTH PENNER.
d its feeders.

Rai[illegible] Productions.—In the Western Ghats [illegible] Maidan it is only modera[illegible] [illegible]wever, well supplied with rivers, and tanks are numerous. The Kavari is used to irrigate a great tract of rich country, and has many anicuts across it. *Millets* (especially *ragi*), *oil-seeds, areca* and *cocoa-nut palms,* and *sandal-wood* all over the Maidan; *sugar-cane* and *rice* in the irrigated valleys; *cotton* in the black soil of the north; *coffee, cinchona* (a little), *teak*, and *cardamoms* on the Ghats are the chief productions.

Note.—*Ragi* is the great crop of Mysore, and is the staple food of the people. It is a hardy plant, not requiring much rain, and growing nearly everywhere. *Coffee* is said to have been first planted on the Baba Budan spur of the Western Ghats by a Mohammedan pilgrim who brought the seed from Mecca.

Race, Language, and Religion.—The people of Mysore are *Dravidians* in race, but there is a mixture of Scythian blood among the inhabitants of the western districts. The percentage of *Hindus* (92) is higher than that of any province or state in India. *Kanarese* is the language of the state.

Towns.—Bangalore (189), in the south-east, at a height of 3,100 feet above sea-level, is the only city in the province. At the present day it is chiefly noted as an important military cantonment, and the headquarters of the Mysore Government. A kind of granite is quarried in abundance in the neighbourhood, and, in consequence, some of the public and private buildings, notably the Maharajah's palace, are very fine structures. Owing to its elevation, and its exposure to both monsoons, Bangalore has one of the pleasantest climates in India. It is a place of considerable trade, with cotton and woollen mills, and carpet manufactures. The old fort, rebuilt by Hyder Ali, was stormed by Cornwallis in 1791. The cantonment is British territory.

Mysore, the capital of the state, some 100 miles south-

west of Bangalore, but not so high, with a fort and a splendid new palace, is a much smaller town with some good modern buildings. Like Bangalore, it has in recent years suffered much from plague.

Seringapatam, on an island in the Kavari, ten miles from Mysore, is famous as the old stronghold of Hyder Ali and of his son Tippu who fell at the capture of the fort in 1799.

Kolar, on a branch of the railway from Madras to Bangalore, is celebrated throughout India for its gold mines, worked by European capital, which have, since they started, produced gold to the value of over fifty crores of rupees. The rock containing the gold is crushed by machinery driven by electricity, which is generated by the Sivasamudram Falls of the Kavari, nearly 100 miles distant, and is conveyed to the mines by wires.

History.—The present ruling family of Mysore traces its descent from a Hindu chieftain, the Wodeyar of Mysore, who rose to power early in the seventeenth century. From about 1760 to 1799 Mysore was ruled by a Mohammedan usurper, Hyder Ali and his son Tippu. On the latter's death at the capture of Seringapatam in 1799, the British Government restored the Hindu dynasty. In 1831, owing to the misgovernment of the Maharajah, the administration of the state was taken over by the British, and for fifty years it remained in their hands. In 1881 it was handed back to the adopted son of the former Maharajah, subject to certain conditions.

BARODA.

Baroda is a native state in Gujarat, in Bombay Presidency. The state consists of four distinct blocks called *prants*, separated from one another by large tracts of British or other territory. The state is well governed under the present enlightened Gaekwar, and has made much progress in railway extension and education. In a small part of Baroda State the experiment of compulsory education of boys and girls has been tried, no fees being charged, and attendance at school being enforced by means of fines. This is the *only* part of India where such an experiment has been made.

Chief Town.—Baroda. (See under Bombay Presidency.)

History.—Early in the eighteenth century a Maratha soldier of fortune, whose family name was Gaekwar or "Cow-herd," rose to power. When the Moghal Empire fell to pieces, his descendants extended their authority over all Gujarat. The territories of the Gaekwar of Baroda at the present day cover part of the fertile plain of Gujarat, and are much intermixed with surrounding British districts. The Gaekwar is bound by subsidiary treaties made with the British Government.

FRONTIER INDIA.

Introductory.—The north-west part of Frontier India is far the most important of its border-lands, as it is the only side on which India is threatened with invasion. The best way to remember it is to think of the north-west boundary of India from the Arabian Sea to the Hindu Kush, *not as a line, but as a belt* of territory, outside of India proper, which the Indian Government has occupied to ward off invasion. [*See maps* 43, 44, 45, *and* 46.]

1. The first or southern part of this belt consists of **Baluchistan.** Native Baluchistan lies west of the Khirthar Mountains, and British Baluchistan west of the Sulaimans. Between these two ranges is the Kachhi desert, leading from the Indus valley into the heart of British Baluchistan. Up this valley runs the railway to Quetta, the forts of which command the Bolan Pass from the north.

2. The second part of the belt, between the north of Baluchistan and the Hindu Kush, consists of a broad strip of tribal territory now known as the **North-West Frontier Province**, consisting of four parts :—

(1.) The **Derajat Frontier**, from the Gomal River to the Kurram valley, including the Tochi and Wana agencies, inhabited by the Waziri tribes.

(2.) The **Kurram Valley**, which has been British territory since 1892.

(3.) The **Peshawar Frontier**, extending from the Kurram valley northwards across the Kabul right up to Kashmir, and including the Tirah country, south of the Safed Koh, the Mohmand country farther north, and the Bajaur, Dir, Swat, and Buner districts, which lie in the valleys of the Panjkora, Swat, and Upper Indus.

(4.) **Chitral**, farther north still, comprising the Chitral valley, on the southern slopes of the Hindu Kush, a native state feudatory to Kashmir, but under the control of the Chief Commissioner of the North-West Frontier Province.

Another way to remember the geography of this part of Frontier India is to clearly fix the valleys and rivers.

These ar
chistan fr
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Chitral or

Still another way is to have a clear idea of the chief passes : (1.) The Bolan and Harnai Passes, guarded by Quetta ; (2.) the Gomal Pass ; (3.) the Tochi Pass ; (4.) the Kurram Pass, called the Peiwar Kotal, over the Safed Koh ; (5.) the Khyber Pass, commanded by Peshawar ; (6.) the Malakand Pass, commanded by the new railway line from Naushahra (Nowshera) to Dargai ; (7.) the Barogil and Dorah Passes, on the Hindu Kush.

The Frontier Policy of the Government of India.— The North-West Frontier Province was formed for the better protection of India against invasion. By this means three important objects are gained :—(1.) Troops are concentrated at certain important points within easy reach of the main passes ; (2.) the tribes are not interfered with except when interference is necessary, and they are entrusted with the maintenance of peace within their own territories ; (3.) the traffic in arms and ammunition across the frontier is regulated.

In 1904 the Viceroy of India, Lord Curzon, said : "India is like a fortress, with the sea as a moat on two sides, and mountains [the Himalayas and their offshoots] on the third. Beyond the walls is a glacis [Frontier India] of varying breadth and dimensions. We do not want to occupy it, but we cannot afford to see it occupied by a foe. We are quite content that it should remain in the hands of allies and friends ; but if unfriendly influences creep up and lodge under our walls, we are compelled to intervene, because danger would thereb ... security."

As we shall see, ... India, *i.e.* Baluchistan and ... nce, are not only mountainou ... iemy to cross, but they have ... enemy must bring all the ... th him. This increases the difficulties of an invader enormously.

BALUCHISTAN.

Baluchistan is a large province, outside of India proper, lying west of the lower half of the Indus. [*See map* 43.]

Shape.—Its shape is irregular, and can only be learned from the map.

Boundaries.—N. Afghanistan and the North-West Frontier Province (from which it is separated by the Gomal). W. Persia. S. Arabian Sea. E. The Punjab (across the Sulaimans), and Sind (across the Khirthar Mountains).

Physical Aspects.—Baluchistan forms an eastern part of the great *Iranian table-land*. It is very mountainous, and those parts which are not mountainous are desert. The highest mountains are round the two towns, Quetta and Kalat. The *Khirthar Mountains*, on the east, separate the southern half of Baluchistan from Sind, and the *Sulaimans* separate the northern half from the Punjab. Between these two ranges is the *Kachhi*, or desert, which stretches from the Indus valley into the heart of the country and cuts it nearly in two. The only rivers of any importance are the *Zhob*, which flows into the Gomal in the north, and the *Puriali*, which enters the sea less than 50 miles from Karachi.

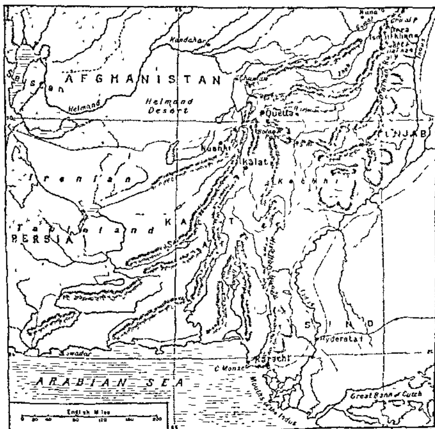
Climate and Productions.—Baluchistan, being outside the influence of the monsoons, is nearly rainless. Owing to its elevation, the dryness of the air, and the direction of the mountain ranges, Baluchistan has a very severe winter. A large part of it being desert, cultivation is carried on by irrigation. (The water is conveyed in underground channels.) Wheat, millets, and the date fruit, none of which require much moisture, are the chief crops. The population is, of course, very thin, and though Baluchistan is the fourth largest province of the Indian Empire, it has only five lakhs of inhabitants—less than the population of Madras city. The people of Baluchistan have a proverb, "When God made the world He left the rubbish in Baluchistan."

The province is made up of two parts—namely, (1.) British Baluchistan, which is a part of British India under a Chief Commissioner, and comprises certain districts ceded by Afghanistan by the treaty of Gandamak in 1879; (2.) Native Baluchistan, the larger part, most of which belongs to the Khan of Kalat, but certain parts—for example, the Bolan

Pass and the Northern Frontier—are directly administered by the Indian Government.

Towns.—With such a sparse population there can be only a few towns. The people are mostly shepherds and small farmers.

Quetta, 5,500 feet above sea-level, in a valley among high



43. FRONTIER INDIA—BALUCHISTAN.

mountains, is the chief station of British Baluchistan. Its importance is altogether due to its position as a frontier garrison post. It guards the northern or Afghan entrance to the Bolan Pass, which leads into the Indus valley. It is therefore very strongly fortified, and is connected with the Indus valley railway by two lines—one through the Bolan

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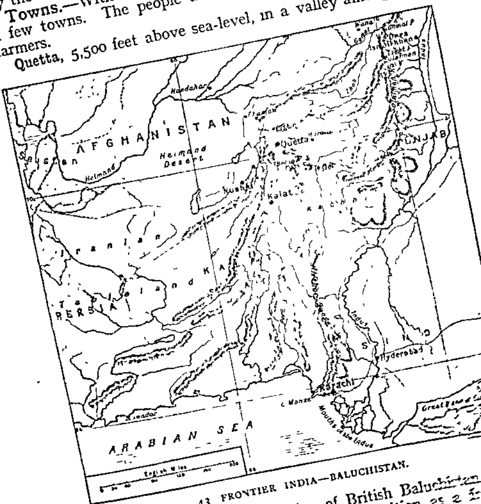
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43 FRONTIER INDIA—BALUCHISTAN.

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Pass, and the other through the Harnai Pass—which meet at Sibi. This line has been carried beyond Quetta to Chaman on the Afghan frontier, overlooking the plains of Kandahar. Quetta is also a place of some trade, being the starting-place of caravan routes to Kandahar and the Seistan district of Afghanistan. Along this latter route a railway line has been made over the mountains as far as Nushki, in northern Baluchistan.

Kalat (6,500 feet), nearly 100 miles south of Quetta, is the fortress of the Khan of Kalat, the head of the Baluchi clans.

THE NORTH-WEST FRONTIER PROVINCE.

Shape and Position.—The North-West Frontier Province consists of a long strip of mountainous country, about 100 miles broad, stretching to the west of that part of the Indus which lies between its bend at Nanga Parbat and Dera Ismail Khan. There is also a narrow strip, the Hazara district, lying to the east of the Indus and north of Rawal Pindi. [*See map* 44.]

A good political map shows clearly the line that divides the Indian Empire from Afghanistan. The Indian Government, cannot take a step beyond this line in peace time; but within this line, *i.e.* to the east of it, there is much "tribal territory," usually marked yellow in political maps, which is geographically within the Empire, but with which the Indian Government does not interfere so long as the tribes dwelling in it keep the peace. Geographically, therefore, these tribes are within the Empire, but for purposes of administration they are outside it.

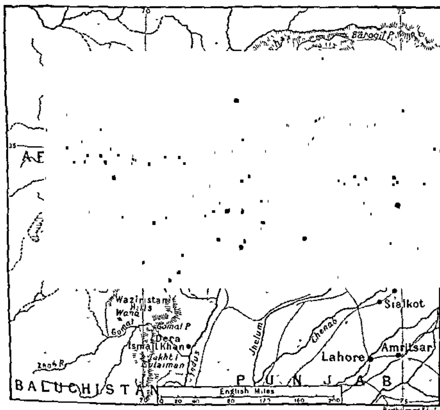
Boundaries.—E. Kashmir and the Punjab. N. and W. Afghanistan. S. Baluchistan and the Punjab.

Physical Aspects.—The whole country is a mass of mountains. The rivers are the keys to the geography of the province. They form the valleys which are the only means of communication through the country. Up these valleys trade routes and military roads lead over the passes which separate the province from Afghanistan. There are four main rivers, all tributaries of the Indus.

1. **The Kabul River** flows from Kabul, the capital of Afghanistan, to join the Indus at Attock. The road does not

follow the river valley all the way, and is called, not the Kabul route, but the Khyber route, from the Khyber Pass through which it goes. The principal town on the route is Peshawar, about 20 miles from the Pass.

Flowing south from the Hindu Kush and its spurs, three feeders join the Kabul River—the **Chitral** or **Kunar River**,



44 FRONTIER INDIA—THE NORTH-WEST FRONTIER PROVINCE.

the **Panjkora**, and the **Swat**. Bridges have recently been built across the Panjkora and the Swat, and a road has been opened up across them to Chitral, a northern frontier post in the Chitral valley.

2. The **Kurram** rises in Afghanistan. At the head of its valley are the Peiwar Kotal and Shutargardan passes, leading across the Safed Koh Range. Kohat stands at the base of the valley.

3. The **Tochi**, rising in the Waziristan Mountains (a part of the Sulaimans), joins the Kurram. The valley is fairly cultivated, but is not much used as a trade route. The chief town on the route is Bannu (Edwardesabad).

4. The **Gomal** rises in Afghanistan, forms part of the boundary between Baluchistan and the province, and enters the Indus near Dera Ismail Khan. The Gomal valley is one of the most frequented routes between India and Afghanistan.

Mountains.—North of the Kabul River is the **Hindu Kush Range**, with its spurs running southward and separating the valleys of the Kunar, Panjkora, and Swat. South of the Kabul River are the lofty **Safed Koh Range**, and the **Sulaiman Mountains**.

Rainfall and Productions.—The whole of the province being out of the path of the monsoons, the rainfall is very light, and there is little vegetation or cultivation except in the valleys.

Towns.—The towns of the province are either military posts or centres of transit trade routes.

Peshawar, a large town of over 90,000 inhabitants, owes its importance to its position. It lies on the main route to Kabul, and is thus important both as a military centre and as the starting-place for caravans across the frontier. It is also on the main Punjab railway system, and is a place of large trade.

Kohat, commanding the Kurram valley, is connected by railway with Khushalgarh on the Indus over which a bridge has here been built. **Bannu**, commanding the Tochi valley and **Dera Ismail Khan**, on the Indus where it is joined by the Gomal, are all important on account of their position as frontier posts. **Chitral**, far north in the Chitral valley, and **Dir**, half-way to it, are small towns, but important as military posts in case of war.

History.—The North-West Frontier Province was formed in 1901. It comprises—(1.) the Hazara district; (2.) certain districts west of the Indus which up till then belonged to the Punjab; (3.) the frontier agencies of Dir, Swat, and Chitral, north of the Kabul River, and the Khyber, Kurram, Tochi, and Wana agencies, south of it. These were all placed under a Chief Commissioner, who is directly responsible to the Government of India. In this way the Government of India

has immediate control over all frontier relations, instead of having, as formerly, to deal with them only through the Punjab Government. The North-West Frontier Province includes all the country of the *Pathans*, a lawless race of Mohammedans, who are now being trained by British officers to become the defenders of their mountains, and the guardians of the passes that lead into India.

KASHMIR.

Kashmir is a part of Frontier India, but its frontier does not touch any country from which real danger to India can be feared. It is simply a native state under British suzerainty, just like any other. [*See map* 45.]

Shape.—Kashmir is like a rough square fitted on to the northern boundary of the Punjab.

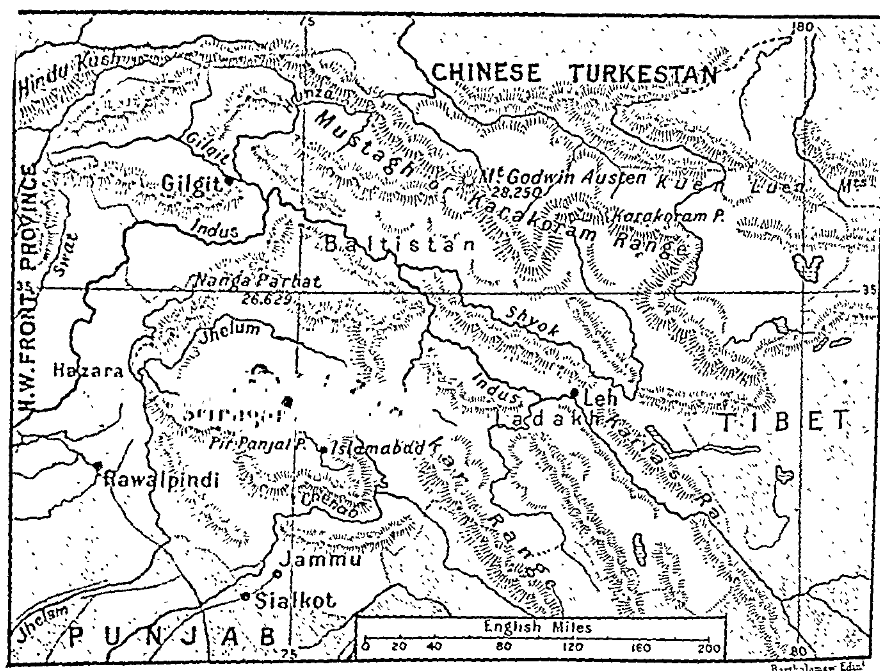
Boundaries.—N. Chinese Turkestan. E. Tibet. S. The Punjab. W. The North-West Frontier Province.

Physical Aspects.—Kashmir is made up of a mass of snow-covered mountains with many narrow valleys and one broad one—the valley of Kashmir. It is divided into two nearly equal parts by the Indus and Gilgit valleys, which meet and form a straight line, cutting across the country from south-east to north-west. All to the north of this line makes up Trans-Himalayan Kashmir; the part to the south is Himalayan Kashmir.

Trans-Himalayan Kashmir is a mass of mountains, and, except in the valley of the Shyok, it is all over 12,000 feet above sea-level. These mountains run from north-west to south-east in three roughly parallel ranges—first the Kailas or Gangri Range, then the Karakorams, and, forming the northern boundary, the Hindu Kush and the southern slope of the Kwen Luns. In no country in the world are there such magnificent masses of snow-covered mountains. The giants of the Alps would here look like dwarfs. The Karakoram Pass, leading into Eastern Turkestan, is over 18,000 feet high; and the loftiest peak of this range, Mount Godwin Austen (named after the man who first measured it), ranks in height next to Mount Everest.

Himalayan Kashmir is also filled with snow-covered

nountains and ice-fields. Just south of the Indus is the nner Himalayan Range, ending in Nanga Parbat (26,000 eet). Farther south is the outer Himalayan Range, here called the Pir Panjal, and between these two ranges lies the beautiful valley of Kashmir, watered by the Jhelum, on which stands Srinagar. Still farther south are the outermost or sub-Himalayan Ranges, through which the Jhelum



45. FRONTIER INDIA—KASHMIR STATE.

and Chenab and their tributaries cut their way into the Punjab plains.

Rivers.—These all flow first north-west, following the line of the mountains, and then bend south-west where they find an opening through them.

The Indus flows north-west through Kashmir up to its bend round Nanga Parbat. The Shyok joins it on the right bank, near the middle point of Kashmir. The Gilgit from the north-west, with its tributary the Hunza, meets it at the bend.

The Jhelum flows first north-west through the Kashmir valley, and then turns sharply south and forms part of the boundary between Kashmir and the Punjab.

The CHENAB flows north-west from the Punjab Himalayas, and then turns south-west to the Punjab plains.

Lakes.—There are many small lakes in Kashmir, both among the mountains and in the valleys. The most important are the WULAR and DAL lakes in the Kashmir valley. Lake Wular is the largest fresh-water lake in India.

Valleys.—The Indus and Gilgit form a long valley intersecting the country, but the most important is the **Kashmir Valley**, watered by the Jhelum and its canals. It is the only large extent of flat country in the state, and its situation among the snow-clad mountains makes it one of the most beautiful regions of the world It is about 80 miles long by 20 miles broad, and it lies over 5,000 feet above sea-level.

Climate and Productions.—Owing to its height and the presence of masses of snow-covered mountains, the climate of Kashmir is never very hot, and from October to April it is very cold. In winter the lakes in the Kashmir valley are partly frozen. The outer range of the Himalayas shuts out the monsoon, and, in consequence, the rainfall is very light. The chief crops are wheat, barley, millets, and pulses which can thrive without much rain. The Kashmir valley is famous for fruits, such as apples, peaches, and grapes, which grow in Europe. Wine is made from the grapes and jam from the other fruit. Tea, cinchona, and hops are also cultivated.

Race, Language, and Religion.—The Kashmiris are of a nearly pure *Aryan race*, but there is a slight admixture of Mongolian blood on the frontier next Tibet. *Mohammedans* make up about three-fourths of the population The Hindus of Kashmir live in the hills, and are called *Dogras*. The people speak very mixed *Aryan dialects* Owing to the mountainous nature of Kashmir and the want of rain in its trans-Himalayan part, the *population* is extremely *sparse*. Very few of the people live in towns.

Towns.—The towns in Kashmir are, except Srinagar and Jammu, small, and are either centres of trade routes or frontier stations.

Srinagar (126), on the Jhelum, in the Kashmir valley, was in old days the hot weather residence of the Moghal emperors. **The city**, made up of quaint wooden houses surrounding the palace and fort, and stretching along the river banks beside the Dal Lake, in the centre of an amphitheatre of snow-clad

mountains, is extremely picturesque. Its former manu factures of shawls and carpets are now much decayed, but a silk factory employing 6,000 persons has been established, and copper-work is still carried on. The commercial importance of Srinagar is due to its being the centre of trade routes to the Punjab, on the one hand, and northern Kashmir and Tibet on the other.

Jammu, on the southern border, at the foot of the outmost Himalayas, on a tributary of the Chenab, is connected by a line through Sialkot with the Punjab railway system. It is the only point in Kashmir yet reached by a railway.

Leh, in Ladakh district, in the Indus valley, is the starting-point of a trade route to Eastern Turkestan across the Kara-koram Pass. Leh (11,000 feet above sea-level) is one of the highest inhabited places in India, and, as it lies behind the Himalayas, and is untouched by the monsoon, it is nearly rainless.

Islamabad, in the Kashmir valley, is the limit of boat navigation on the Jhelum.

Gilgit, in the Gilgit valley, is a frontier station nearly 5,000 feet above sea-level, commanding the passes to the north over the Hindu Kush.

History.—Kashmir has given its name to a large state of which the Kashmir valley is but a small part. The state includes Jammu in the south, Ladakh in the east, Baltistan in the north, and Gilgit in the north-west, along the Gilgit valley.

Kashmir proper was conquered from the Afghans in 1819 by Ranjit Singh, the Sikh ruler of the Punjab. The government of the country was given to Gholab Singh, a Dogra Rajput, who conquered and annexed the Tibetan province of Ladakh. In 1846, after the first Sikh War, the British confirmed Gholab Singh in his possessions, in return for a payment in money; and he signed a subsidiary treaty by which he agreed to present annually one horse, twelve goats, and three pairs of shawls in token of his recognition of British supremacy.

NEPAL, BHUTAN, AND SIKKIM.

Nepal and **Bhutan** are independent states, and so should, strictly speaking, not be included in the Indian Empire; but they are under engagements with the Indian Government, and are practically under its protection against the invasion of any foreign power. Nepal has a British Resident at the capital, but he does not interfere with the internal affairs of the state. Bhutan receives an annual subsidy of half a lakh of rupees from the Indian Government. [*See map* 46.]

Nepal is a long strip of mountainous country, including the inner and outer Himalayan Ranges.

Boundaries.—N. Tibet W. The United Provinces. E. Bengal and Sikkim. S. The United Provinces and Bihar and Orissa.

Physical Aspects.—Nepal is a country of mountains and deep valleys, intersected by rivers flowing down to the Ganges plain.

Mountains.—The HIMALAYAS in Nepal are very massive and high. Dhaulagiri (26,800 feet) in the western, and Everest (29,002 feet) in the eastern half, are the highest peaks. Along the foot of the Himalayas stretches the *Tarai*, a feverish jungly valley, cultivated in parts, and the best hunting ground in India for big game.

Rivers.—Three rivers drain the valleys into the Ganges:—(1.) The GOGRA, with its feeders the Kali and Karnali, in the west; (2.) the GANDAK, with two feeders of the same name, in the middle; and (3.) the KOSI, in the east.

Climate and Productions.—There is a heavy rainfall, but only the lower valleys are cultivated, rice, millets, tobacco, and oil-seeds being the chief crops. Sal and sisu are the principal timber trees; it is too cold for teak.

Industries and Trade.—There are no industries in Nepal, except, of course, agriculture, but its trade with India has lately much increased. Nepal sends to Bengal grain, pulses, and oil-seeds, some jute and sabai grass (used for paper-making); and takes, in return, cotton goods, metals (brass, copper, and iron), salt, and sugar.

Town.—The population of Nepal is supposed to number only about three millions. **Katmandu**, the capital, lies in

mountains, is extremely picturesque. Its former manufactures of shawls and carpets are now much decayed, but a silk factory employing 6,000 persons has been established, and copper-work is still carried on. The commercial importance of Srinagar is due to its being the centre of trade routes to the Punjab, on the one hand, and northern Kashmir and Tibet on the other.

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Nepal is a long strip of mountainous country, [illegible] the inner and outer Himalayan Ranges.

Boundaries.—N Tibet. W. The United Provinces. E. [illegible] gal and Sikkim S. The United Provinces and [illegible]

Physical Aspects.—Nepal is a country of [illegible] deep valleys, intersected by rivers flowing down [illegible] plain.

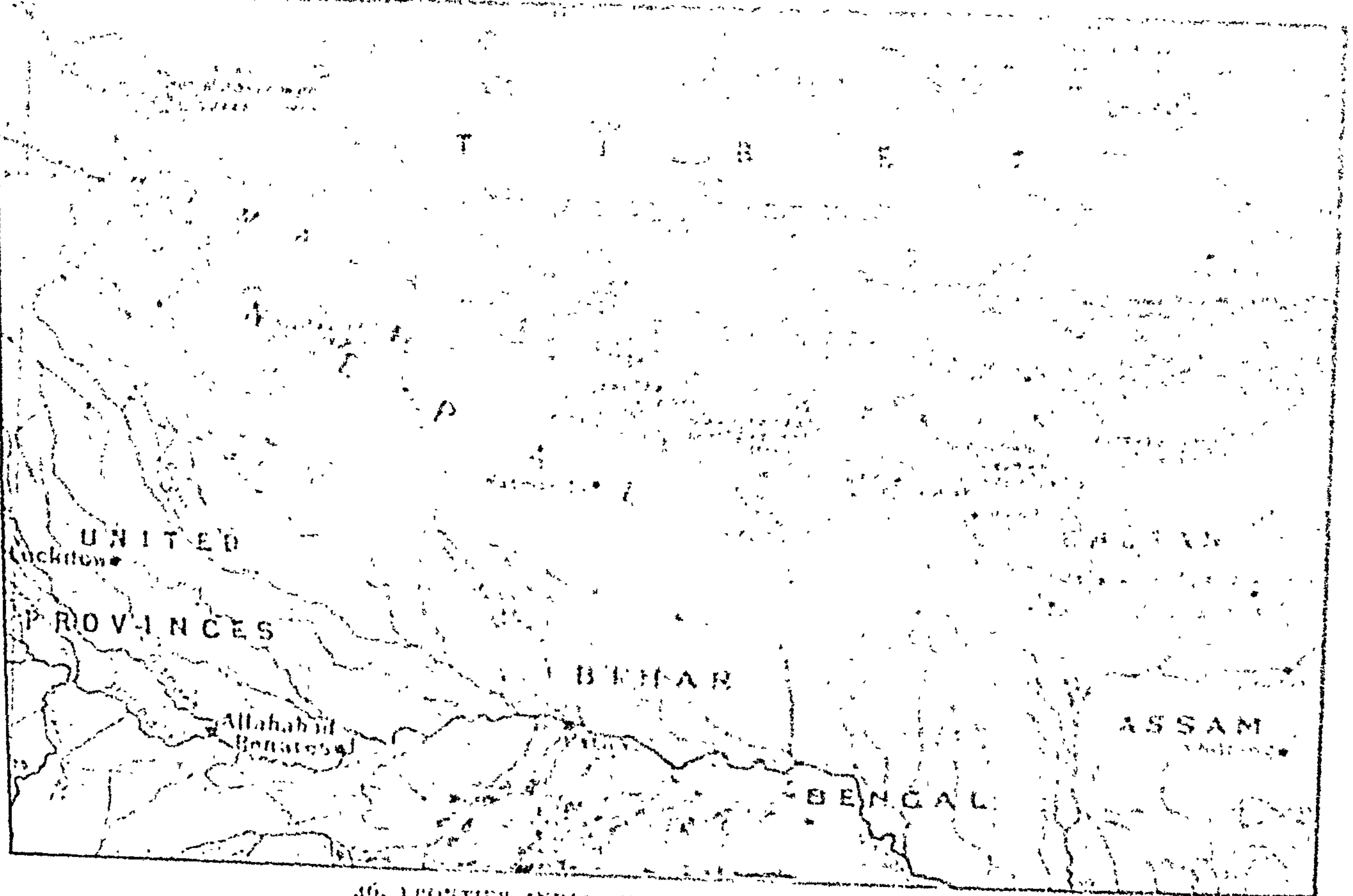
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Climate and Productions.—There [illegible] only the lower valleys are cultivated, [illegible] and oil-seeds being the chief crops. [illegible] principal timber trees; it is too cold [illegible]

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Town.—The population of [illegible] only about three millions. [illegible]



46. FRONTIER INDIA—NEPAL, BHUTAN, AND SIKKIM

a valley, 4,500 feet high, among the mountains near the centre. Little is known about it. "We do not even yet know, for a certainty, which is the best route to the capital."

History.—Very little is known about Nepal, as no stranger is allowed to explore the country, and the Resident at Katmandu is the only European permitted to enter it. Since the Nepalese War (1814-1816), when the Nepalese lost their best provinces of Garhwal and Kumaon, now part of the United Provinces, there has been very little intercourse with the country. But both rulers and people are friendly to the British, and arrangements are made every year by which a certain number of Nepalese (Gurkhas) are recruited for the Indian army. These are among the finest soldiers India possesses.

[illegible] square miles.

Boundaries.—N. Tibet. W. Bengal (Sikkim). S. The provinces of Bengal and Assam. E. The country of unsettled hill tribes.

Physical Aspects.—The Himalayas fill up most of the country. *Chumalhari Peak* (24,000 feet) lies in the north-west. Among the ranges are numerous valleys, where alone cultivation is carried on. The drainage of these valleys flows through the Dwars into the Brahmaputra by several rivers, of which the *Manas* is the largest.

Trade.—Bhutan trades with Tibet rather than with India. The value of its trade with India for a whole year does not equal that of a single ship's cargo. It sends a little wool and wax, and some ponies, and takes cotton goods, salt, and tobacco.

Capital, **Punakha**, about which little is known.

History.—Bhutan is an unknown and uncivilized country. In 1865 an expedition was sent to punish the Bhutanese. The Dwars, a tract of densely forest-clad plains, about [illegible] miles broad, was taken from Bhutan, and now forms part of the province of Bengal. Two military posts, Buxa and

Diwangiri, at the foot of the Himalayas, are held by Indian troops. Once a year a chief comes to Buxa to receive the subsidy paid by the Indian Government, and Bhutan is left alone.

In 1905 a peaceful mission was sent to Punakha, and a better idea of the geography of the country was obtained. The scenery is described as the most magnificent in the world. One of the Himalayan peaks, Kulha Kangri, rises to 24,740 feet, and there are great valleys and stupendous gorges. The Lamas, or Buddhist priests, were found to be most hospitable, receiving the mission in their jongs, or fort-monasteries, among the mountains. The people were found to be skilful in wood-carving and metal-work.

Sikkim.—Between Nepal and Bhutan lies the protected state of Sikkim. Since 1890, when an expedition was sent by the Government of India to expel Tibetan invaders from the country, the government of the state has been under a British Political Officer appointed by the Bengal Government. In 1890 Great Britain and China signed a treaty settling the boundary between Tibet and Sikkim, and acknowledging the British Protectorate over Sikkim. The state is small, and has a population of little more than half a lakh, but it is important, because here the territory of a protected state touches Tibet. The **valley of Chumbi** (belonging to Tibet) lies between Sikkim and Bhutan, and through this passes what little trade there is between India and Tibet.

In 1906 Sikkim was placed under the direct control of the Government of India.

THE ASSAM BORDER TRIBES.

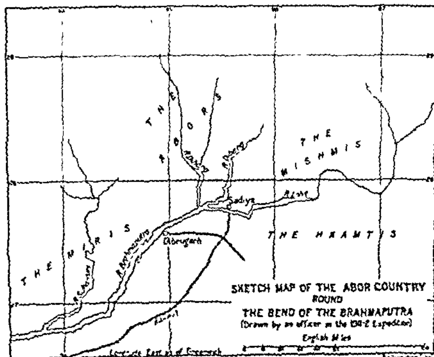
The Assam Border Tribes and Manipur.—The Himalayan country to the east of Bhutan and lying north of Assam is occupied by a number of unsettled tribes, of which the Akas, the Abors, and the Nagas are the chief. They are really independent, and so, strictly speaking, are not within the limits of the British Empire; but the Indian Government takes responsibility for them (1) by sending expeditions among them, when necessary, to keep them in check; (2) by protecting them against foreign invasion.

The country of the *Lushai tribes*, in the south-eastern

corner of Assam, is now British territory, and forms a district under the Chief Commissioner of Assam.

Manipur.—*Since 1891, when the Manipuris murdered the* Chief Commissioner of Assam, the state has been under British protection. A force of frontier police keeps the lawless people in check.

rising to 6,000 feet, and on the confines of Tibet up to heights of 15,000 or 20,000 feet above sea-level The Dihang flows among these hills over waterfalls and between rocky banks, so that it is not likely it will ever be a highway of navigation It is practically certain that the Dihang is the same river as the Tsanpo, though this has not yet been proved It has not yet been explored beyond 29° N The *Dihang River* (*see map* 18) is quite small The Abors live on a poor kind of rice grown in clearings on the hillsides and on jack fruits They hunt game with bows and arrows Their houses are all built on piles and thatched with plantain leaves The rainfall is very heavy.



46a SKETCH MAP OF THE ABOR CO

BURMA.

Geographical Position.—Burma is the northern part of the Indo-Chinese Peninsula, and comprises the territory lying between lines **XS**, **SM** on diagram, p. 10, and the Bay of Bengal, *plus* a long strip of coast running south to Cape Victoria. [*See maps* 47, 48, 49, *and* 50.]

Points for the eye to remember.—The line of the Salween and the line of the sea-coast.

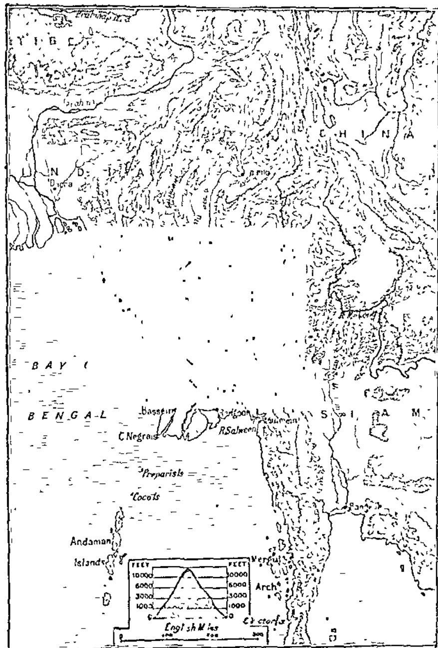
Relief.—Burma comprises all the country enclosed by the eastern offshoots of the Himalayas and the sea. In the northern part it consists of *masses of mountains;* towards the south these mountains open out into separate ranges enclosing *river valleys;* and all along the sea-board is a flat *coast-strip.*

Physical Features: Mountains.

The Patkais, Lushai Hills, and Arakan Yomas.—Starting from our point **S**, a mass of mountains runs roughly along **SX** towards Chittagong, and then narrows into a long range till it ends in the rocky headland of Cape Negrais. The northern half of this mass divides Burma from India proper (Assam). Here it is known as the **Patkai Mountains**, and a little farther south as the **Lushai Hills** and **Chin Hills**. After it narrows into he long single range it is called the **Arakan Yomas.***

Burma is thus shut off from India (Assam) on the north-west by a mass of densely forest-clad mountains, ranged in steep and high ridges running nearly north and south and intersected by deep and narrow valleys inhabited by wild tribes. These mountains form a barrier which has kept the peoples of the two countries separate in race, language, religion, and customs. Crossing the Arakan Yomas is the **An Pass**, 5,000 feet above sea-level.

* *Yoma* in Burmese means a ridge like a *bone*, and the Yomas are the skeleton of Burma.



47. BURMA—PHYSICAL FEATURES.

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47. BURMA—PHYSICAL FEATURES.

Shan Hills and Tenasserim Yomas.—Starting again from our point S, another mass of mountains runs, at first almost due south, in parallel ranges. These become broken up and form large table-lands, and then thin off into a single range which runs down the Malay Peninsula till it ends in Cape Victoria. The northern half of this mass is the SHAN HILLS, and the long range in the south is the TENASSERIM YOMAS.

Pegu Yomas.—Between these two great ranges of the Arakan and Tenasserim Yomas, and dividing the lower valleys of the Irrawaddy and Sittang rivers, is a smaller, shorter, and lower range called the PEGU YOMAS.

The chief points to notice about the mountains of Burma are therefore these :—

1. The main ranges and their spurs run nearly north and south, hence communication east and west is difficult.

2. The ranges gradually become lower as they come south. Thus the Arakan Yomas in their northern part rise to 10,000 feet. Mount Victoria, one of their detached spurs, is the highest peak in this part of Burma. The Shan Hills rise higher—to summits over 11,000 feet in height, but the Tenasserim Yomas are much lower. Near the left bank of the Irrawaddy, about half way up its course, is Mount Popa, an extinct volcano, 5,000 feet high.

3. The mountains of Burma, as they receive a plentiful rainfall, are covered with vegetation.

Rivers.—The rivers of Burma are the key to its physical geography. There are three main rivers, all of which flow nearly from north to south, following the line of the mountain ranges.

The Irrawaddy: Drainage.—The Irrawaddy with its tributaries drains nearly the whole of Burma. On its right bank it receives all the heavy rainfall of the southern slopes of the Patkais, Lushai, and Chin Hills, and the eastern slopes of the Arakan Yomas; on the left bank it receives the drainage of the Shan Hills and Pegu Yomas.

Course.—The Irrawaddy rises in the unexplored Kachin hill country lying between the bend of the Brahmaputra and the Salween. There two mountain streams, the N'maikha from the north-east, and the Mali Kha from the north-west, join to form the main river. The general course of the Irrawaddy

English Miles
0 100 200 300
CHINA
TIBET
Patkai Hills
Kachin Hills
Mali kha
Myitkyina
ASSAM
Bhamo
Salween
Kuntan Ferry
Lushai Hills
Mu
Chindwin
Mandalay
Myitnge
Shan Hills
Pakokku
Arakan Yoma
Akyab
Ramree I.
Cheduba I.
Irrawaddy
Pegu Yoma
Prome
Sittang
Henzada
Pegu
BAY OF BENGAL
Bassein
Rangoon
Moulmein
SIAM
C. Negrais
Mouths of Irrawaddy R.
GULF OF MARTABAN

48 THE RIVER BASINS OF BURMA.

is nearly due south from the mountains to the sea, and it flows slowly.

Stages.—1. **Mountain stage.** This may be said to extend from its sources to Myitkyina (*Mitchina*), some 50 miles south of the junction of the N'maikha and Mali Kha. During this part of its course very little is known of the Irrawaddy or of the rugged mountainous country through which it flows.

2. **Plain stage.**—From Myitkyina to Prome. During this stage the river flows through a narrow but fertile valley. Here the mountains are never far from the river, though they become lower as we near the sea. During a great part of this stage the river flows through the Dry Belt of Burma and so gets very little help from tributaries. Thus the Irrawaddy plains cannot compare in extent with those of the Ganges or Indus.

3. **Delta stage.**—At Henzada, not far below Prome, and when still 100 miles from the coast, the Irrawaddy reaches the flat plain of its delta and begins to give off distributaries, fourteen of which carry its waters into the Gulf of Martaban. Of these the western outlet is the **Bassein River,** up which steamers can come for 15 miles above Bassein harbour. The eastern outlet is the **Rangoon River,** on which Rangoon stands. This channel is deep enough to allow ocean steamers to come up to Rangoon harbour, and it gives a passage to flat-bottomed river steamers to the Irrawaddy in the rains.

The delta of the Irrawaddy resembles that of the Ganges in general features. It is, of course, much smaller. While the waterway of the Hooghly has to be kept constantly dredged, that to Rangoon is shorter and much more easily navigable. The Rangoon river is connected by a creek across the delta with the main stream of the Irrawaddy.

Tributaries of the Irrawaddy.—As the Irrawaddy flows, for the most part, along narrow valleys hemmed in by hills, there is not much room for many large tributaries. Just about the centre of its course, however—that is, near Mandalay—the valleys are wider, and here, therefore, we find one or two large tributaries. On the left bank the **Myit-nge** * brings the drainage of the Shan Hills in the north-east. A little farther on, the **Mu**, a small feeder, enters it on the right bank; and still lower down, the **Chindwin**, its largest *tribu-*

* *Myit*=" river," *nge*=" small."

tary, brings all the drainage of the southern slopes of the Patkai Mountains and Lushai Hills.

The Salween, a much longer river than the Irrawaddy, is not nearly so important, because during nearly the whole of its course it flows through mountainous country. It is therefore a *rushing, rapid river, with a rocky bed and many sharp turns*, and it is only navigable near its mouth. It rises far to the north of the sources of the Irrawaddy in the unexplored part of Tibet, bends, in a narrow valley, past our point S, and then flows nearly due south in a deep trough among hills and table-lands till it enters the Gulf of Martaban at Moulmein. Owing to its being hemmed in by mountains which run parallel to it for a great part of its course, the Salween has a comparatively narrow and small drainage area, and, in spite of its greater length, it usually carries less water to the sea than the Irrawaddy. Its mountain stage may be said to continue from its source to near its mouth. It is *only navigable for a few miles up, and it has no delta*.

The **Sittang**, which lies between the Irrawaddy and the Salween, is a very much smaller river than either of them. It drains a low-lying region, between the Pegu Yomas on the west and the Shan Hills on the east into the Gulf of Martaban. The Sittang valley is very fertile. It is also very flat, and thus gives the best approach by railway into the interior. *The river itself is, however, not important, being blocked by* sandbanks, and therefore useless for navigation except in the monsoon. It is also subject to a *bore* in which no boat can live except at sheltered points.

The main rivers of Burma are thus very easy to understand.

(1.) Owing to the run of the mountain ranges, they all flow nearly due south.

(2.) They flow through narrow valleys, and so they have few tributaries (the Irrawaddy receives its chief feeders just south of Mandalay, where its valley is broadest).

(3.) They flow through a country and from mountains which receive a great deal of rain, *and so they never run dry*, and are full and deep for many months of the year.

The Irrawaddy is, however, **by far the most important of the rivers of Burma**, because (1.) though not the longest river, it has much the largest drainage area—the basin of the Irrawaddy

takes up about three-fourths of the whole area of Burma; (2.) it has valleys along its course, which the Salween has not, and it spreads into a big delta which the others do not; (3.) it is navigable for three-fourths of its length (to beyond Bhamo, 900 miles from the sea), while the Sittang is choked with sand-banks, and the Salween flows through rocky, impassable mountain gorges. Even in the dry weather the Irrawaddy is over a quarter of a mile broad up to Mandalay: in the wet season its breadth is doubled and its depth trebled. Even the Chindwin is navigable for 300 miles; (4.) it flows through a fairly well civilised country, while the Salween, though longer, flows through mountains, the home of wild tribes. It has several important towns and points of call on its banks, while the Salween has only one—Moulmein—at its mouth.

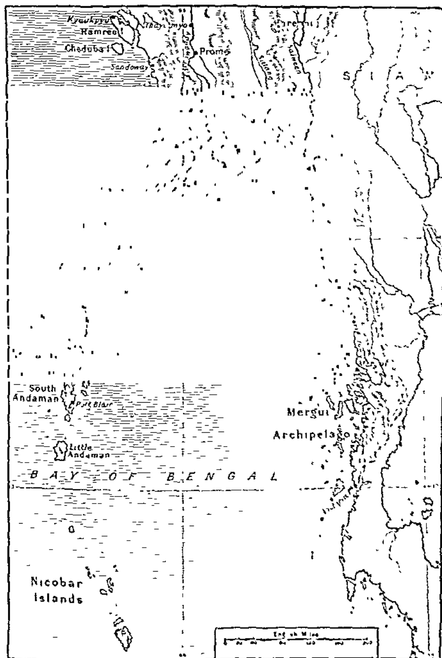
The boundary of Burma runs for about 100 miles along the **Mekong**, but this river really belongs to French Indo-China.

Coast and Islands.—The coast of Burma from Cypress Point to Cape Victoria is more broken than that of India, and has numerous islands lying off it. It is naturally broken into two parts by the delta of the Irrawaddy and the Gulf of Martaban. The northern half, from Cypress Point to Cape Negrais, is the **Arakan Coast**; the southern half, from the mouth of the Salween to Cape Victoria, is the **Tenasserim Coast**.

Cape Negrais, the end of the Arakan Yomas, is the only important promontory. It is important because it protects the Bassein channel of the Irrawaddy delta.

Islands.—Off the Arakan coast lie the volcanic islands of **Ramree** and **Cheduba**, with a few others little known. Off the Tenasserim coast lies the **Mergui Archipelago**, a group of hundreds of small islands covered with evergreen vegetation. Extending from near Cape Negrais right down to near Achin Head in Sumatra is a line of islands in *four groups*, which are supposed to be the tops of submarine mountains that stretch, as a continuation of the Arakan Yomas, to Sumatra. These groups in order are the **Preparis**, **Cocos**, **Andamans**, and **Nicobars**.

The Andamans are made up of four fairly large islands, the three largest together being 150 miles long. They are called the North, Middle, and South Andaman, with the little Andaman farther south. The Nicobar group comprises some twenty islands, mostly very small.



49. BURMA—SOUTHERN PORTION, WITH ISLANDS.

Note.—(1.) All these islands differ from the Laccadive and Maldive Islands, off the west coast of India and Ceylon, in not being of coral formation; (2.) they are rather obstacles than aids to navigation; (3.) the Andamans and Nicobars, though geographically belonging to Burma, are politically separate from it. They are under a Chief Commissioner of their own.

Regions of Burma.—From the relief and build of Burma we can divide it into three regions :—

1. **Region of Coast-strips**—the Arakan and Tenasserim coasts, that is, the flat, narrow alluvial tracts lying between the sea and the Arakan and Tenasserim Yomas. These strips resemble in climate and general features the Malabar coast of India. They are too closely hemmed in by mountains to contain any large rivers. Their heavy rainfall makes them excellent rice land, and on the mountains teak flourishes.

2. **Region of Plains and Uplands**—that is, Central Burma, including the basin and delta of the Irrawaddy and the basin of the Sittang. This is the heart of Burma, made up of the mountain slopes and table-lands among which the Irrawaddy and its feeders rise, the plains down which they flow, and the rich delta land where their waters enter the sea. The climate is, in the northern part, owing to the elevation, more temperate than that of the coast-strip, and the whole region is one of the most fertile parts of the Indian Empire, capable of growing in abundance all the crops of the Tropical and sub-Tropical Zone. But much of this vast area, outside the lower courses of the Irrawaddy and Sittang, is little known, and most of it is quite undeveloped—that is, it is mostly covered with jungle and forest, which has to be cut down. There are few roads, and only a single line of railway (through the southern part). The next fifty years will make a great difference to this part of Burma.

3. **Region of Table-lands**—that is, the Salween basin or Shan States. This region is even less known than Central Burma. It is a land of elevated plateaus, separated by deep valleys, and intersected by lofty forest-covered parallel ranges of hills running north and south. The general elevation of these table-lands (from 3,000 to 5,000 feet) is a little higher than that of Mysore, and some of the mountains rise to 9,000 feet. This region of Burma, owing to its elevation, has a temperate climate, and may become a great wheat-bearing district. At present it is very little cultivated by the wild tribes who inhabit it.

monsoon months, May to October, a rainfall of about 190 inches, but during the rest of the year little rain falls.

Moulmein on the Tenasserim coast has a climate very similar to that of Akyab, and that for similar reasons.

Rangoon on the delta. Here too the climate is very similar to Akyab; only, Rangoon having no mountain range behind it has a rainfall of only half that of Akyab, say 100 inches.

(ii) On plains:

Mandalay in the upper Irrawaddy Plain.

Latitude.—22° N., and so just within the Tropics.

Height.—Only 250 ft. above sea-level.

Nearness to Sea.—Mandalay is too far inland to allow the sea to have any influence. Besides, there are mountains on the east and west. Hence the climate is hot in summer and coldish in winter.

Direction of Mountains.—The Arakan Yomas keep off the monsoon, and the mountains to the north and north-east keep off cold winds. The Arakan Yomas prevent the full force of the monsoon from reaching Mandalay, and it is in the Dry Belt of Burma, getting only about 30 inches of rain in the year.

Nature of the Soil.—Mandalay is built on the alluvial mud of the Irrawaddy valley which in the hot weather makes the town very dusty.

(iii) On table-lands:

The Shan States, the Chin and Kachin Hills, have, on account of their elevation, a temperate climate, the thermometer seldom going above 80°, and, in the coldest months, there is frost at night, and sometimes it snows on the highest hills.

Productions.—The heavy rainfall of Burma is peculiarly suited to *rice*, which covers about five-sixths of the cultivated area, and is largely exported. In the uncultivated tracts, every kind of *timber* known in India (especially *teak*) grows wild in the forests, and the *rubber* tree in addition. In the dry area maize, millets, wheat, pulses, gingelly, onions, chillies, tobacco, ground-nut, and cotton are grown to some extent. But Burma is not yet fully opened up. When the jungles are cut down and roads and railways are made, its productions will be vastly increased both in quantity and variety.

The People, Race, Language, and Religion.—Burma is the south-western corner of the great Mongolian region of the earth, and the Burmese are all Mongolians, with the

exception of a very slight admixture of Dravidian blood from India. The reason why the people of Burma are so pure in race is that the country is shut off by mountains in the north-west, and by the Bay of Bengal in the west, from India. Owing to the vast inaccessible mountains and jungles which take up a great part of the country, Burma contains many wild tribes. Of these the **Shans**, who inhabit the great stretch of highlands on both sides of the Salween, are the most numerous and most civilised. In the north, round the sources of the Irrawaddy and Chindwin, live the **Kachins**. In the south of the Salween basin are the **Karens** (divided into Red and White Karens), a fighting race who have lately embraced Christianity in considerable numbers. Among the Shans live the **Kakhyens**, an uncivilised race of fetish worshippers (Animists) occupying the hill districts. The rest of the country is occupied by the **Burmese**, but there are also many **Chinese**, and **natives of India** are migrating into the country in great numbers.

The people of Burma speak languages of the Indo-Chinese family, of which **Burmese** is the chief. The religion of the great bulk of the population is **Buddhism**, but among the hill tribes (except the Shans) **Animism** prevails.

Burma is thinly populated. Though the largest province in the Indian Empire it has fewer inhabitants to the square mile than any other. The reason of this is—(1.) a great deal of the country is mountainous; (2.) till recently there was no settled government, and the country was depopulated by wars. The uplands are thinly, and the plains, whether wet or dry, thickly populated. The increase of population is greatest in the very wet area of the coast-strips and delta, where the land is flatter and less jungly, and the soil is therefore productive. In modern times the population is rapidly increasing owing to immigration and settled government.

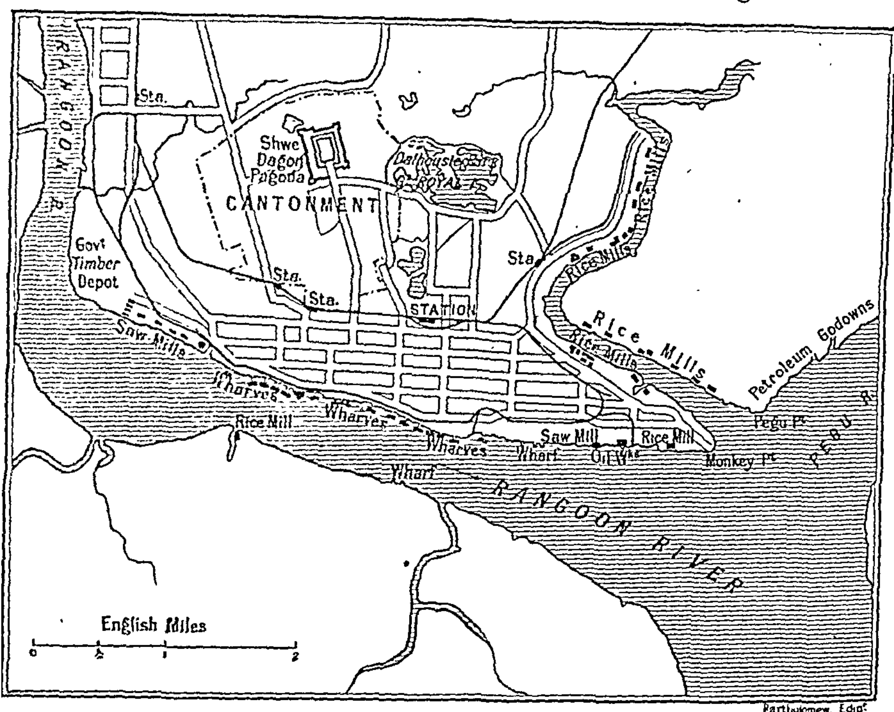
Political Divisions.—Burma is divided, for purposes of administration, into Lower and Upper Burma. Lower Burma comprises the coast-strips and the Irrawaddy delta, and Upper Burma the rest of the province.

Towns.—Burma is a country with *few towns*, and these are, unlike those of India, *almost all modern*. The reasons for the scarcity of towns are:

(1.) Burma, like India, is, and has always been, a country

50. BURMA—NORTHERN PORTION.

is the greatest rice-shipping centre in the world.* Its wide river gives anchorage to large ocean-going steamers which export the rice, teak, oil, and other products of Burma and bring back the manufactures of Europe. Rangoon is also the *river-inlet* and the *railway-inlet* of the rich country lying behind it. In short, it is the meeting place of the foreign and inland trade of the province. It has, besides, large works in



51. RANGOON.

Note.—The regularity of the streets tells us that Rangoon is a modern town.

which the rice from up-country is cleaned, the teak sawn, and the mineral oil refined.

Rangoon is the capital of Burma and contains the chief Government Offices and the Law Courts. As the Burmese prefer the easy life of the country to the business of towns, Rangoon is a great centre for immigration and more than

* Owing to its good inland communications by river and railway, Rangoon has had a great advantage in trade over such ports as Akyab and Moulmein, which, being cut off by mountains from the interior, are confined to the trade of the surrounding districts.

half its population consists of natives of India, Chinese, and Parsis, who are attracted to it by high pay and profits. *Insein* (a suburb of Rangoon farther up the river) is a growing place.

In its geographical position at the outlet of a large delta and in its favourable situation for trade Rangoon resembles Calcutta; but the advantage is, in almost every respect, with Calcutta.

Calcutta (1.) is the sea-outlet for one of the largest, most fertile, and most densely populated regions of the Empire	**Rangoon** (1.) is the sea-outlet for a much smaller, narrower, and less thickly populated region.
(2.) The Gangetic plain is intersected by two large rivers and many tributaries and by many roads and railways.	(2.) The Irrawaddy plain is watered by a single river with few tributaries, and has few roads and only a single line of railway.
(3.) The Gangetic plain leads into the teeming and civilised continent of India.	(3.) The Irrawaddy valley leads up to inaccessible, jungle-covered mountains, the homes of uncivilised tribes.

It is unlikely, therefore, that Calcutta can ever be equalled by Rangoon as a seaport; but we must remember (1.) that the Irrawaddy basin is, as yet, only beginning to be opened up, and (2.) that if the proposed railway from Mandalay to Kunlon Ferry, on the Salween, is taken across the Mekong to Yunnan, Rangoon may, in the future, become the outlet for a great part of the rich trade of China.

Mandalay (138), the only city in Burma except Rangoon, was the capital of the King of Upper Burma at the time of the third Burmese War. Mandalay is favoured by its position (1.) in the broadest part of the Irrawaddy valley, where that is joined by the valleys of the chief tributaries of the river; (2.) at the head of the valley of the Sittang. It is therefore destined to be the centre of the railway systems of Upper Burma. Alread valley to Myitkyina; gu and Rangoon; a tl Kunlon Ferry; and a f valley. The former co alay is decaying, owing to the competition of cheaper foreign-made silks.

Other towns :—

1. **Seaports.**—**Moulmein**, at the mouth of the Salween, and protected by the island of Bhilu, was, at the time of the British annexation in 1824, a mere fishing village. Favoured by its position, it has increased in size and importance till it is now a town of nearly 60,000 inhabitants, and the second seaport of Burma, exporting yearly goods to the value of a crore and a half of rupees. Moulmein has rice mills, and exports large quantities of cleaned rice; it is also the great *teak port* of Burma, for the Salween, though of little use for navigation, floats down great rafts of this timber from the wooded hills.

Bassein, some eighty miles from the sea on the most westerly channel of the Irrawaddy, takes in big steamers, and is one of the chief outlets for the rice crop of the upper delta and plains.

Akyab, near the mouth of the Kaludan River, navigable for 90 miles inland most of the year, was, at the time of the British annexation, a small hamlet. It is now the third port of Burma, and the centre of the trade of the fertile rice-bearing Arakan coast-strip. It is a feeder port for Rangoon and Calcutta.

Kyaukpyu, on a harbour formed by Ramree Island, farther south, is another feeder port. So is **Sandoway.**

Amherst, Tavoy, and **Mergui** are minor ports on the Tenasserim coast-strip. The two latter have a special trade in edible birds'-nests and pearls.

2. **River-Ports.**—Myitkyina (*Mitchina*), Bhamo, Mandalay, Pakokku, Magwe, Yenangyaung (the oil port), Minbu, Thayetmyo, Prome, and Henzada are centres of river traffic on the Irrawaddy. Kunlon Ferry is far up the Salween.

Myitkyina, a small port on the highest reaches of the Irrawaddy, 50 miles below the junction of its two mountain feeders, is connected with Mandalay by railway. It is an outpost of civilisation. The country beyond it is almost unknown.

Bhamo owes its importance to its position. It is the terminus for steamer traffic up the river, and is only 20 miles west of the Chinese frontier. Through it most of the trade with China passes, and when this is developed, its importance will vastly increase. It is also a mart for the scanty products of the Kachin districts.

Pakokku, the nearest town to the confluence of the Chindwin and Irrawaddy, is a depôt for the collection of timber logs floated down this tributary; it is also a boat-building centre.

Prome is the centre of a fruit-growing district.

Henzada,, the head of the rich delta, and a depôt for delta rice, is connected by railway with Bassein and with the Pegu-Mandalay line.

Pegu, connected with the Sittang by a canal, is a railway centre on the line to Mandalay; another line has now been made from Pegu to Moulmein.

Kunlon Ferry, far up the Salween, may, entirely on account of its position, soon be a very important place. It is the meeting-place

of the trade between Burma and Western China, and it will be connected with Mandalay by a railway up the Myit-nge valley.

3. **Ancient Capitals.**—Burma is a country of ancient capitals. AVA, SAGAING, and AMARAPURA are on the Irrawaddy plain south of Mandalay PAGAN, now deserted, but, 500 years ago, a fine city with many pagodas, is on its left bank, a little below its junction with the Chindwin. As in former times houses in Burma were all built of bamboo and teak, the king and his astrologers could easily order the people to pull down one capital and build another elsewhere.

Magok, the ruby-mining village, lies in the hills on the left bank of the Irrawaddy about 100 miles north of Mandalay.

Mineral Resources.—Burma, like India, has few minerals.

Petroleum.—This is by far the most important mineral production. Burma produces 98 per cent. of the total output of the Indian Empire The oil is chiefly got in the Yenangyaung and the Yenangyat oil-fields in the Irrawaddy valley in Upper Burma It is being exported in larger and larger quantities to India (Calcutta, Madras, and Bombay), but India, as a whole, has hitherto used oil from Russia and America.

Coal is obtained in the valley of the Chindwin, but the output is very small compared to that of Bengal.

Tin is found in the Tavoy and Mergui districts of the Tenasserim coast.

Gold is being dredged in the upper reaches of the Irrawaddy beyond Bhamo.

Rubies.—The rubies of the Burma ruby mines north of Mandalay are commercially the most important gems found in the Indian Empire.

Jade is also obtained, and is exported to China.

Industries.—The chief industry of Burma, as of India, is agriculture. Burma is not, as India is, an old civilised country, and there are, therefore, few important industries besides the tilling of the soil. The chief of these are connected with Burma's three main products—namely, (1.) the husking and cleaning of *rice* in large steam mills; (2.) the felling and floating down the rivers of *teak* trees, which are sawn into logs in teak mills; (3.) the pumping of *mineral oil* from wells, refining it, and making it into paraffin wax and candles for export. Wood carving is also a great Burmese art; lacquer work and the boiling of cutch are other industries. Many Burmese make their living as boatmen on the rivers.

probably be reached by a line from Bassein up the flat Arakan coast-strip to Chittagong, or by a line connecting Myitkyina with the upper Assam valley. China may be reached by a line from Kunlon Ferry to Yunnan, or by a line striking eastwards from Myitkyina.

Trade.—1. Inland Trade.—As there are few towns in the interior, and as the country is intersected by mountain ranges, there is comparatively little inland land trade, and most of it consists in forwarding rice, teak, and oil down the rivers to the ports for shipment.

The Irrawaddy is, of course, the great highway for inland trade. The rich delta sends thousands and thousands of boat-loads of paddy to the Rangoon rice-mills; crude petroleum comes from the wells in upper Burma to be refined in Rangoon and sent to India or shipped up-stream again in the shape of kerosene oil or candles; the teak floated down from the hills to the sawmills is sent abroad; the wet or pickled tea from the Shan states and northern uplands is a favourite food of the southern Burman, who sends in return *ngapi* (a preparation of fish which forms a staple food in the country) and salt; the dry parts of the country send down-stream peas, beans, millets, ground-nuts, jaggary (coarse sugar), cutch dye, tobacco, and a little cotton; up-stream come cotton goods, hardware, crockery, and matches.

2. Foreign Trade.—As agriculture is the chief industry of Burma, its foreign trade consists in exporting the produce of the soil, and receiving in exchange the manufactured goods of other countries.

Exports.—*Rice* is by far the most important export. This crop covers five-sixths of the whole cultivated area, and, as the population is sparse, there is a large surplus for export. Rice is sent to Great Britain and Europe for distilling purposes, to make starch, and for food, and to the rice-eating countries in the East, such as Japan, China, and the Straits Settlements. Burma is a great granary of rice for India in case of famine.

Teak.—Burma is the great country for teak. Most of it goes to Great Britain. Burma's rival in teak is Siam.

Mineral Oil.—The export of this oil from Burma is a thriving trade. The oil is refined (as kerosene oil) in Burma, and is exported to China and the Straits. It is also made into

FRONTIER BURMA.

In the extreme north of Burma the boundary is still undefined, but by conventions with the Chinese, the French, and Siam, the eastern boundary dividing Burma from China, French Indo-China, and Siam has been settled. Inside this boundary, *however, the country is so mountainous and impassable* that the British have not yet been able to introduce law and order among the frontier tribes. These tribes are protected as far as possible from invaders across the border, but they are not much interfered with by the British.

Kachin Hills.—The tribes on these hills beyond the confluence of the N'maikha and Mali Kha, feeders of the Irrawaddy, are not interfered with, provided they do not make raids southward. South of this point peace is enforced, the tribes are disarmed, and roads are being made.

The Chin Hills.—The tribes on these hills, which lie between Burma and Bengal, are now entirely under British administration.

The Shan States, lying east of the Irrawaddy, are divided into the Northern and Southern Shan States. They have now come under British administration, though the great extent of territory which they cover is almost impassable.

Karenni.—This territory lies on the Salween River below the Southern Shan States. It is not included in British territory, but the Superintendent of the Shan States has some authority over it

It will take many years to bring all this frontier country of Burma under good government and civilisation. Until roads and railways are built little progress is possible. At present Frontier Burma forms a belt of territory (separating true *Burma from China, French Indo-China, and Siam) where the* people are but little interfered with so long as they keep the peace.

Of course in these wild mountainous regions there are no towns.

THE PEOPLES OF THE INDIAN EMPIRE.

RACES.—Although many different races inhabit different parts of the Indian Empire, they are by no means sharply marked off from each other. For example, the people of the Aryan race have spread themselves all over India as "conquerors, traders, landowners, or priests." Thus, though the people of the peninsula are, on the whole, of Dravidian blood, the highest classes among them, and especially the Brahmins, have a large mixture of Aryan blood.

1. **The Dravidians.**—Long before history begins, India was inhabited by savage or half savage tribes. They were rather short, with very dark skins, hair, and eyes, and broad noses. These were the Dravidians, and they still occupy the peninsula of India.

There are scores of isolated Dravidian tribes, such as the Santals in Bengal proper, the Juangs of Orissa, the Gonds of the Central Provinces, the Konds on the northern spurs of the Eastern Ghats, the Todas on the Nilgiri Hills, and other tribes on the Western Ghats. But the main body of Dravidians dwells in the south of the peninsula. They speak highly cultivated languages, such as Tamil, Telugu, Malayalam, and Kanarese; have made great advances in civilisation; and have long been converted to Hinduism.

2. **T**[illegible] before the Christian
era, In [illegible]
stature [illegible]
regular [illegible]
Kashmir, and Rajputana. These Aryans brought their wives and families with them, and they have thus kept their race almost pure. The Rajputs and Jats are Indo-Aryans.

3. **The Aryo-Dravidians.**—Long after this first invasion of Aryans into India, a second wave of Aryan invaders conquered and settled in the plains of the Ganges and Jumna (the Madhyadesa or middle-land). They did not bring their

wives and families with them, and therefore married women of the Dravidian races whom they conquered. The result was a mixed or Aryo-Dravidian race, people of darker complexions, shorter stature, and broader noses than the pure Indo-Aryans. This type now occupies the country of the Jumna and Ganges up to the outer Himalayas on the north, and down to the slopes of the Central India table-land on the south.

4. **The Mongoloids.**—On the north and east India touches the great Mongolian region of the earth (Tibet and China). The Mongolians are short, with dark, yellow skins, flat faces, and eyelids often oblique. To this type belong the peoples of the part of Kashmir nearest Tibet, Nepal, Assam, and Burma.

5. **The Mongolo-Dravidians.**—Where the Mongolians and the Dravidians touch—that is, in the east of Bengal and Orissa—there is another mixed race, partly Dravidian and partly Mongolian, of dark complexion, medium height, and with broad noses. The Bengalis are mostly of this type.

6. **The Scytho-Dravidians.**—Long after the Aryans settled in India successive invasions of Scythians forced their way from the west into Sind, Gujarat, and the western Deccan. Here they mixed with the Dravidians, and their descendants have broad heads, dark skins, and broad noses. The Marathas belong to this type.

7. **The Turko-Iranians.**—In Frontier India—that is, in Baluchistan and the North-West Frontier Province—the people are of a different type from those of India proper. They are supposed to be a mixture of Turks and Persians, and have fair skins, dark and sometimes grey eyes, and narrow and very long noses. The Baluchis and Afghans are of this type.

RELIGIONS.—Animism and **Hinduism.** As the Aryans intermarried with the Dravidians, so they gradually converted them to their religion. The Dravidians were *Animists*—that is, they believed that man is surrounded by a number of powers and spirits dwelling in trees, rivers, rocks, and waterfalls, which must be made friendly by magical practices. It was impossible in such a large area as India, among so many different tribes speaking different languages, that the religion of the Aryans could spread without being much changed. The Dravidians were made Hindus, but they kept many of their old Animistic beliefs and practices. Hence,

just as the mass of the people of India is of mixed race so their religion is the mixed religion which is called *Hinduism.* In its lowest forms it is just Animism: in its highest it comes very near Pantheism. "Between these extremes . . . there is room for every form of belief and practice that it is *possible for the human imagination to conceive.* *When we* say there are over two hundred and eighteen millions of Hindus in India, we do not mean that this great mass of people has any beliefs in common, but that they observe caste customs and reverence the *Brahmins.* *Though in India the mass* of the people is Hindu, yet in isolated parts of the country there are still scattered tribes untouched by Hinduism, who know nothing of caste and perform magical ceremonies to keep off evil spirits.

Mohammedanism.—Long centuries after the Aryans had invaded, conquered, and converted India, new hosts of con- c[illegible] invasion These [illegible] *In race they were* r[illegible] a new religion—that of Islām—which they often tried to enforce at the sword's point. Their descendants and the descendants of those whom they converted to their faith are the Mohammedans or Mussulmans of India, who now number sixty-seven millions.

Besides the ancient Aryans and the Mohammedans, India has received small bodies of outsiders who have had little or no influence on race or language, and only a little on religion. Among these are the Parsis, Europeans (chiefly British), and Jews.

The **Parsis** are Zoroastrians, who worship God under the symbol of fire. They came originally from Persia. They number only some 94,000.

[illegible] -ench, and British) have [illegible] *religion,* to which nearly [illegible] belong. There is, however, in [illegible] still ext[illegible] have exi[illegible] reason, and partly [illegible] missionary effort, the States of Cochin and Travancore alone contain over a quarter of the total native Christian population of India.

The **Jews** are very few in number, and are found on the

west coast. In Cochin they have been settled for over twelve hundred years.

Besides these religions, which have been introduced from outside, there are three which have grown up in India itself.

1. **Jainism** is not, as has been supposed, an offshoot of Buddhism, but is quite as ancient a faith. It resembles Buddhism, but the Jains do not believe in Nirvana.

2. **Buddhism** was founded nearly two thousand four hundred years ago by Gautama; but though it has spread over a great part of Eastern Asia, it is nearly extinct in the land of its birth. There are, however, many Buddhists in Burma, and a few on the frontiers touching Tibet.

3. **Sikhism**, or religion of the Sikhs, involves the worship of one God, and prohibits image-worship and faith in omens and magic. Strict Sikhs have no caste distinctions, and do not recognise the Brahmins.

List of the Chief Religions of India:—

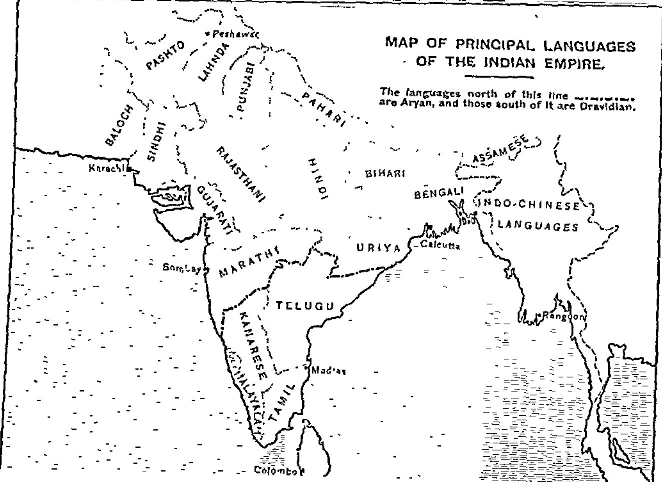
Hindus................	218	millions.	
Mussulmans.........	67	,,	
Animistic religions	8½	,,	
Sikhs..................	2	,,	
Jains..................	1¼	,,	
Christians............	4	,,	(nearly)
Buddhists	10¾	,,	(almost all in Burma).

LANGUAGES.—There are said to be one hundred and forty-seven distinct languages spoken in India. They may be divided into three great families: (1.) Dravidian; (2.) Aryan; (3.) Indo-Chinese. [*See map* 52.]

1. The **Dravidian Languages** are spoken in the south of the peninsula, including the whole of the Madras Presidency, in Mysore, and in the southern strip of the Bombay Presidency, of Hyderabad, of the Central Provinces, and of Bengal.

Tamil is the most cultivated and the best known. It is spoken over the whole of South India as far as Mysore and the Ghats on the west, and a little farther north than Madras town on the east.

Telugu, "the Italian of the East," is most widely spread, and is spoken over all the east of the peninsula north of the Tamil area. The Telugu country is the "Andhra" of the Sanskrit writers, and the "Telingana" of the Mohammedans.


MAP OF PRINCIPAL LANGUAGES OF THE INDIAN EMPIRE.
The languages north of this line are Aryan, and those south of it are Dravidian.
Peshawar
PASHTO
LAHNDA
PUNJABI
PAHARI
BALOCH
SINDHI
Karachi
RAJASTHANI
HINDI
BIHARI
ASSAMESE
BENGALI
INDO-CHINESE LANGUAGES
GUJARATI
URIYA
Calcutta
Bombay
MARATHI
TELUGU
KANARESE
Rangoon
Madras
MALAYALAM
TAMIL
Colombo

Malayalam is spoken on the Malabar coast. It is an offshoot from Tamil.

Kanarese is spread over Mysore (its true home), and over part of Bombay and Hyderabad.

Tulu is a highly cultivated language, with no literature, spoken in a small area in South Kanara district on the west coast.

There are other Dravidian languages or dialects of Telugu, Tamil, and Kanarese spoken by the hill tribes all over this area. The tongues spoken by the Todas and Badagas of the Nilgiri Hills, the Gonds and Konds of the Central Provinces, and the Santals in Bihar and Orissa, are examples.

2. The **Aryan Languages** are spoken over the rest of India proper. They are derived from the Prakrit or spoken language of the ancient Aryan invaders. The chief Aryan languages are **Hindi**, **Bengali**, **Bihari**, **Uriya**, **Rajasthani**, **Gujarati**, **Punjabi**, and **Marathi**. Of these, Hindi is most widely spoken. *Hindustani* is the language spoken by most Mohammedans in India, and is the polite speech of most natives of India. As a vernacular, it is a dialect of Hindi. With a knowledge of Hindustani a person can make himself understood by all educated persons in India north of the Godavari.

3. **Indo-Chinese Languages.**—These are spoken in the hill country east of the Ganges plain and throughout Burma. **Burmese** is the most important.

Of these three families, the Aryan languages are spoken by 234 millions; the Dravidian by 63 millions; and Indo-Chinese by 12 millions.

Note.—In the census of India, 1911, little more than a quarter of a million of people returned *English* as their mother-tongue.

MINERAL RESOURCES OF THE INDIAN EMPIRE.

[illegible] in [illegible] Jh[illegible] near the Damodar valley, within 200 miles of Calcutta. There are also mines in Assam, at **Warora** in the Central Provinces, at **Umaria** in the Rewah State in Central India, and at **Singareni** in Hyderabad. The annual production of coal in India is only about ten millions of tons, while Great Britain produces 260 millions yearly. But India already produces enough for her present wants. It comes almost entirely from the Bengal mines.

Iron.—The chief sources of ironstone are at **Salem** in Madras, at **Chanda** in the Central Provinces, and at **Raniganj** in Bengal proper. The Raniganj iron, which is smelted at Barakar, is the only iron at present mined on a large scale. It is found close to the coal mines. The other iron fields are not worked, owing to the difficulty of finding near them good coal and lime to smelt the iron

Gold.—The production of gold in India is practically confined to the gold fields of Kolar in Mysore, where nearly £2,200,000 worth of gold was obtained in 1911.

Mineral Oil.—The great oil fields are in Burma, which yield 98 per cent. of the oil produced in the Indian Empire. The chief oil wells are Yenangyaung and Yenangyat in Upper Burma.

Salt.—In India salt is largely mined. The Government of India has the making of salt in its own hands. Salt is produced (1.) by *evaporation from sea-water*, chiefly in Madras; (2.) from the Sambhar Lake in Rajputana, and brine pits in the Rann of Cutch; (3.) it is dug out of the Salt Range mines in the Punjab; (4.) it is imported from abroad, chiefly from the United Kingdom and Germany. Inferior salt is made

from salt earth in various parts of India, but the manufacture of this salt is illegal. The people of Bengal have to import their salt because the large rivers make the sea-water half fresh.

Other Minerals.—Tin is found in the Tavoy and Mergui districts of Lower Burma, but it is, as yet, not largely worked.

Manganese (used in the manufacture of steel) is found in large quantities near Vizagapatam in Madras, in Mysore, and also, in greater quantities, in the Central Provinces. India is now, next to Russia, the largest producer of manganese ore in the world.

Mica (a good non-conductor of heat and electricity) is mined at Hazaribagh in Chota Nagpur, in Madras, and in Bengal.

Rubies and **jade** are found in Upper Burma, **plumbago** in Travancore; **copper** is known to exist in the north of Bengal, and **saltpetre** is found in the Bengals.

Annual Output of Coal in Certain Countries:—

	Tons.	
Great Britain	264,000,000	in 1910.
United States	411,000,000	in 1909.
Germany	214,000,000	,,
Austria	48,000,000	,,
France	37,000,000	,,
Belgium	23,000,000	,,
Japan	14,000,000	,,
India	12,000,000	in 1911.
Australia	8,000,000	in 1909.

THE INDUSTRIES OF THE INDIAN EMPIRE.

The chief industry of the Indian Empire is **Agriculture.** About two-thirds, or 66 per cent., of the population gets its living from the tilling of the fields, pasturing of cattle, or forests. In India, as a whole, about nine persons out of ten are supported by simple village occupations which are directly or indirectly dependent on the cultivation of the soil.

The Geography of Agriculture.—We have seen how different soils and climates suit different crops. We can also see how the shape of the country—its hills, plains, and table-lands—will favour different methods of agriculture.

On the Mountain Regions few crops, except tea, coffee, and cinchona can be grown. Where the rainfall is heavy the mountains are covered with forests and the lower hills are used for grazing sheep and cattle: in some parts, where flat terraces can be cut in the hill-sides and supplied with plenty of water, paddy is cultivated.

In the Plain Region there are many snow-fed rivers flowing through flat soil, so there are many canals. The local rainfall being also good there is plenty of water near the surface, and so there are many wells which need not be dug deep. But as the surface is very flat and the ground soft it is difficult to catch water in tanks. Besides, owing to the steady snow-fed supply of water, tanks are not needed.

The same thing is true of the alluvial tracts in the **Coast-strips,** especially where they widen into big deltas.

In the Table-land Region, as the rivers are not snow-fed and dry up to a great extent in the hot season, and as the ground is rocky, there are almost no canals. Owing to the small rainfall and rocky soil there are few wells, and these are difficult to dig. The surface is uneven, so there are many tanks to catch the rain-water, and this is the best way of making use of the rain-water which only falls in certain seasons.

The **other industries** may be divided into three classes: (1.) indigenous or native industries, worked without steam, which have been practised in India for centuries; (2.) modern industries, which have been introduced into India, and which are carried on in large mills and factories worked by steam engines; (3.) industries connected with agriculture.

INDIGENOUS INDUSTRIES.

1. **Handloom Weaving of Cotton Cloth.**—This has always been the most important industry of India, except of course agriculture, as every one in the country wears cotton cloth. Formerly India used to export cotton goods to Europe (for example, the calicoes made in Calicut), but nowadays people in India wear cotton cloth made in steam mills either in India or in England, so that the handloom weaving is confined to (1.) the coarsest kinds of cloth; (2.) special kinds of cloth, such as the turbans and *saris* of Bombay, or the muslins of Arni, Cuddapah, and Madura, in the Madras Presidency, or of Dacca, in Bengal.

2. **Silk Weaving.**—Fine silk hand-woven from mulberry silk, is made chiefly in the Bengals; coarse, or tusser, silk is made in Assam, where the raw silk is gathered from cocoons in the jungles.

3. **Handloom Weaving of Woollen Goods.**—In a warm country like India the people do not as a rule need warm woollen clothes, but in the cold weather of the north they are much worn. Sheep have good wool only in the colder regions: *in the hot plains of Bengal and in the coast-strips* they have hair rather than wool. Thus, as a general rule, we can say that the best wool is grown in the north among the Himalayas and in the parts farthest from the sea where the cold is greatest in winter. This is the reason why wool is grown chiefly in the Punjab and Kashmir and why shawls and carpets are chiefly made in towns such as Amritsar, Lahore, Multan and Srinagar.

4. **Wood-carving.**—India has always been famous for wood-carving. In almost every house in Great Britain, Indian toys, boxes, book-covers, and ornaments are to be found made of ebony, ivory, sandal-wood, bamboo, or horn. The Burmese are also skilled carvers in teak.

5. **Metal-working.**—The making of brass and copper

vessels, either plain for household use or carved for ornaments, is a great industry in India They are made from sheets of brass or copper imported from abroad. Madura and Benares are two of the chief centres. In recent years the making of cooking vessels and other articles of *aluminium* has begun, and is increasing in the city of Madras.

Besides these industries there are many other crafts, such as those of carpenters, blacksmiths, silversmiths, goldsmiths, mat-makers, and potters, who are found in every village.

INDUSTRIES CARRIED ON IN STEAM FACTORIES.

1. **Cotton Mills.**—By far the greatest manufacture of India is that of cotton It is divided into two branches: (1.) the spinning of cotton thread or yarn; (2.) the weaving of cotton cloth There are in India about two hundred mills, nearly all of which are in Bombay Presidency. Indian cotton has not so fine a "staple," * or quality, as American cotton, and so the finest cotton cloth worn in India comes from England, which uses American cotton. India not only supplies her own people with yarn and cloth, but exports them largely abroad. The yarn goes to China, and the cloth to East Africa, China, and Ceylon.

2 **Jute Mills.**—India has a great advantage in the manufacture of jute, because it is the greatest jute-growing country in the world. There are about forty jute mills in India, and they are nearly all in Bengal, chiefly on the banks of the Hooghly. The jute is there manufactured into coarse cloth largely used for making *gunny bags*, which are exported to the United States, Great Britain, Australia, and the Argentine. A great deal of the grain trade of these countries is carried in gunny bags made in Bengal jute mills.

3. **Other Industries.**—The other industries are all much less important than these two principal ones

Woollen mills, which make cloth for the use of the army and police, in the United Provinces and the Punjab.

* "Staple" simply means the length of the fibre or thread. If we pull a fibre out of the boll of an Indian cotton plant it will be found to be under an inch in length; the fibre of American cotton is over an inch long and it is more silky.

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Paper mills, which make foolscap and blotting paper for Government offices, chiefly in Bengal.

Flour mills, in the wheat-producing provinces, the Punjab, Sind, and the United Provinces.

Cotton-ginning factories and cotton presses, in the cotton-growing districts of Bombay, Berar, Madras, the United Provinces, the Punjab, and Central Provinces.

Breweries.—Beer requires a cool climate for its manufacture, and the breweries are chiefly on the hills of the United Provinces and the Punjab. Murree has the largest brewery in India. Most of the beer is bought by Government for the use of European soldiers.

Printing presses, in the provinces where education is most widespread—that is, chiefly in Bengal, Madras, Bombay, and the United Provinces, and in most large towns.

Mills for husking and grinding rice, chiefly in the rice-growing provinces of Burma, Bengal, and Madras.

Timber mills, in the teak-growing countries, Burma and Assam, and Malabar.

Potteries and tile works, in almost every province.

Tanneries, in Madras and Cawnpore.

Coir factories, on the west coast.

INDUSTRIES CONNECTED WITH AGRICULTURE.

1. **Tea factories** for preparing the leaf are almost confined to Assam, the great tea-growing country. There are also a few in the tea districts of Madras, the United Provinces, and Bengal.

2. **Indigo factories** are chiefly found in the indigo-growing districts of the United Provinces, Madras, and Bihar and Orissa.

3. **Coffee works** for preparing the coffee berry are confined to the west coast of the Madras Presidency, where most of the coffee is grown.

COMMUNICATIONS.

Railways in India have been built :—

1. **In the most fertile and most densely populated parts of the country, because here there is most passenger and goods traffic.** [*See map* 53]

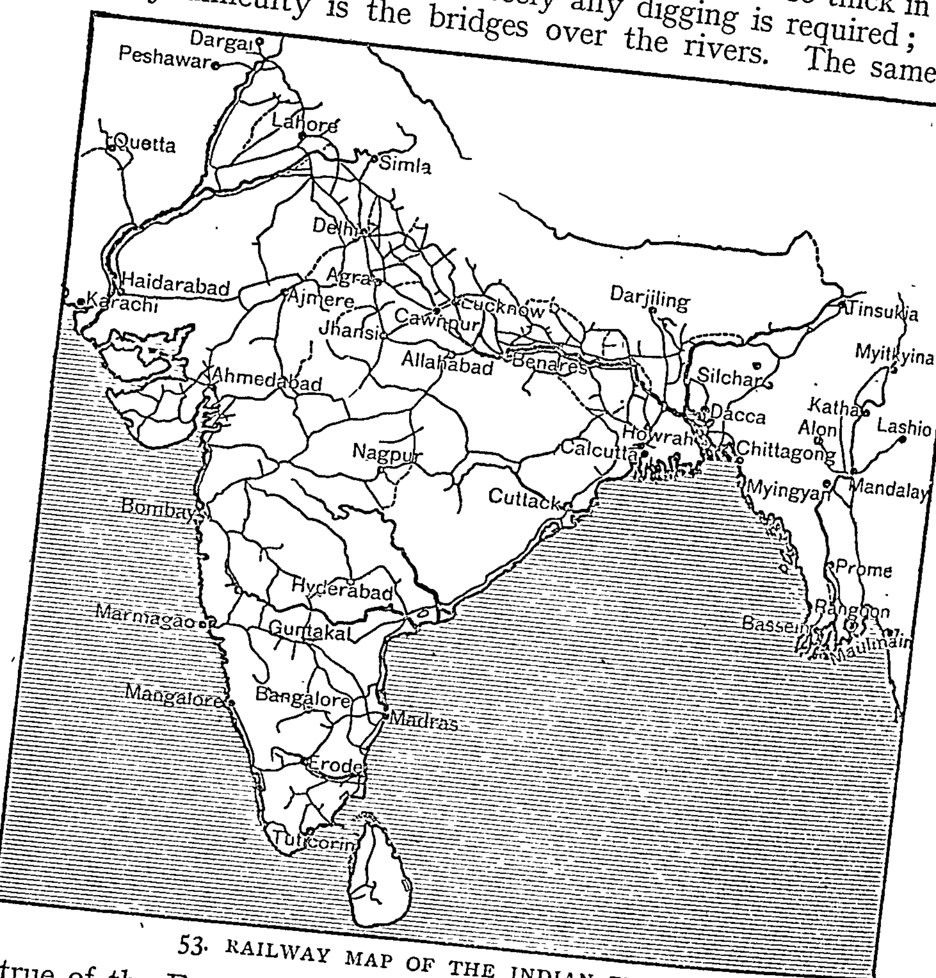
Thus the railway map of India shows that the railways are thickest in the great Indo-Gangetic plain. A great trunk line runs from Calcutta through Benares, Allahabad, Cawnpore, Agra, Delhi, Ambala, and Lahore to Peshawar, and another from Benares to Ambala through Lucknow and Bareilly. But besides these main lines, there are many others, and almost every large town in the plain region is a junction of two or more lines. So also in
the Carnatic there are many
Sind, the Central Provinces,
country is not highly cultivated and the population is sparse, there are but few lines.

2. **To connect large towns,** especially to connect important seaports with inland centres of trade.

All the cities and towns of the plain region are connected with each other. **Bombay** is connected with the Gangetic valley towns by lines which enter Agra, Cawnpore, Allahabad; with Calcutta by one line through Allahabad, and by another through Nagpur; with Madras and the Carnatic, and with the towns of Gujarat and Rajputana. **Calcutta** is joined to Madras by the East Coast Railway, which passes through the three important deltas and many seaports. **Madras**, besides its connections with Calcutta and Bombay, has one line to the fertile west coast at Calicut, and another to Tuticorin, the port for the Ceylon trade. **Karachi** is joined by the Indus Valley Railway to
of the Gangetic plain. E
and the country beyond
upper Irrawaddy valleys.

3. Where they are most easily and cheaply made—tha
in flat country.

This is another reason why railway lines are so thick in Indo-Gangetic valley—scarcely any digging is required; only difficulty is the bridges over the rivers. The same



53. RAILWAY MAP OF THE INDIAN EMPIRE.

true of the East Coast Railway and the line from Madras to Tuticorin, which runs along the flat coast-strip. But in a mountainous country like Kashmir there are no railways. The Himalayas and the mountains of Burma have nowhere been crossed, and the Western Ghats only in three places—the Bhor Ghat, the Thal Ghat, and the Palghat Gap.*

* A fourth line now joins Goa with the line through the rich district Dharwar.

4. **For military purposes.**

The whole of the Indus Valley Railway may be considered a military railway—that is, it has been built in order to convey troops and guns quickly to any part of the frontier. Off this line short branches strike up to the passes—for example, the lines to Quetta and the Bolan Pass, a line from Kohat towards the Kurram Pass, a line from Peshawar to Jamrud at the mouth of the Khyber, and a line from Naushahra, on the Peshawar Railway, to Dargai, at the Malakand Pass.

5. ***As distributors of food in time of famine.***

When famine comes on a district the cattle die, rivers and canals dry up, and railways are the only means of carrying food to save the people from starvation. The railways of Rajputana, the Punjab, and the Madras Carnatic were partly built for this purpose. As time goes on these lines gather traffic, and repay their outlay.

Rivers.—The **Indus**, the **Ganges**, the **Brahmaputra**, and the **Irrawaddy**, with their tributaries, are the chief means of inland navigation. Being snow-fed, they remain full during the hot weather.

The **Indus** carries goods from the southern Punjab and Sind. Karachi is its port. The railway has taken away much of this trade. The river is constantly changing its bed, and is therefore not easy to navigate. The railway along the Indus valley has taken away all the steamboat traffic.

The **Ganges** and its tributaries carry a large amount of cheap and bulky goods up and down the Great Plain, but the many railways have stolen much of the steamer traffic. The Ganges with its tributaries still, however, carries more boat traffic than any other river in the world except the Yangtse-kiang. River steamers go up the Ganges to Cawnpore and up the Gogra to Faizabad. The Nadia rivers which comprise the upper waters of the Hooghly are navigable by steamers during the rains.

The **Brahmaputra**, with its tributary the Surma, conveys the traffic of eastern Bengal and of Assam to Calcutta. It is the great natural highway to the north-east, and is navigable for steamers as far as Dibrugarh, 800 miles from the sea. Steamers go up the Surma as far as Sylhet.

The **Irrawaddy** brings down teak and timber and rice and

oil to Rangoon. It is navigable as far as Bhamo, and there is a service of magnificent steamers on the river and on the Chindwin.

There is some boat traffic on the Mahanadi, Godavari, Kistna, Narbada, Tapti, and Salween.

NOTE.—It must be clearly understood that when we speak of a river in India being navigable, we only mean that it can be used by boats, small sailing vessels, or steamers, specially made for the purpose with *flat bottoms. No ocean vessel ever goes* farther up a river than the sea-water reaches.

Roads.—In ancient times there were scarcely any roads in India or Burma; everything had to be carried on pack animals. During the last fifty years the Government has made roads all over the country connecting the chief towns. When a railway is built, roads are soon made to the stations on it from the towns and villages on either side. The **Grand Trunk Road** runs from Calcutta to Peshawar, and is the great highway for cart traffic through the fertile plain region. Roads are most numerous on the flat alluvial and fertile plains of India, because (1.) they are there most easily made; (2.) owing to the density of population they are there most wanted. But the great drawback to the making of roads on the alluvial plains is the scarcity of stones and rock to metal the roads. Thus Bengal and Bihar have, owing to their flatness and the density of their population, many more roads than the Madras Presidency, but they have far fewer *metalled* roads. So also in Burma it is difficult to make good roads over the alluvial stoneless soil of the Irrawaddy valley.

Canals.—The most important canals in India are meant for irrigation purposes, but some have been designed for navigation by small boats. The principal navigation canals are those in Bengal, through the Sundarbans, and along the Orissa coast, the Ganges and Agra canals in the United Provinces, and the Buckingham Canal from Madras to the Kistna delta. The Great Ganges Canal runs from Hardwar to Cawnpore. The backwaters of the Malabar coast are natural canals.

Outside the deltas of Bengal, Orissa, Madras, and Sind navigable canals will never be of much use as a means of inland communication.

THE TRADE OF THE INDIAN EMPIRE.

One person exchanges things with another person because he makes some gain by doing so. The thing he gets is more valuable or useful to him than the thing he gives. In the same way the people of one district or country trade with the people of another district or country because they profit by doing so. By giving something which they can grow easily or make cheaply they get something else which they can only grow or make with difficulty. Thus the people of both districts or both countries gain. India or Burma might, at very great expense, make their own machinery with their own iron, and in the same way England might, perhaps, grow rice by keeping hot water flowing under the plants, but at what a cost! So both England and India gain if England makes the machinery and India grows the rice, and if the one is exchanged for the other.

For a very long time the trade of India with other countries was very small. The reason for this was that there were no railways and hardly any roads in the country; only on rivers, such as the Ganges, was there any traffic. Therefore the ships that came to India could take away only the crops that grew quite close to the coast, and the goods which they brought from other countries could not be taken up-country. Thus if a ship came to Calicut, she traded only with the part of the Malabar coast round the town, and the cargo she brought could not be sent inland to the Deccan. But after roads and railways were made it was quite different. People in India now began to grow crops such as cotton, or indigo, or oil-seeds, or wheat (which foreign countries want), because there were roads and railways to take them to the coast, and of course they got other things in exchange from abroad.

Another great benefit was the opening of the Suez Canal in 1869, which shortened the journey between India and Europe very much. This, of course, made the carriage of goods much cheaper, and insects and worms had not time to

destroy cargoes of grain as they did when the ships went the long voyage round the Cape of Good Hope. The Suez Canal has also, as it were, turned India's face westwards. In former times, to a ship doubling the Cape of Good Hope, Calcutta was almost as near as Bombay; but, in modern days, a steamer coming from Europe by the Canal can reach Bombay or Karachi some days before she can get to Madras or Calcutta round the south of Ceylon.

The building of large iron steamers also helped to shorten the voyage and cheapen the cost of carriage. In this way the trade of India has changed. Long ago India could send to Europe only precious things, in small bulk, such as spices, or ivory, or silk; now, when the cost is much less, she can send all kinds of crops and so her trade has grown enormously. Again, long ago the people of India grew crops for their own use only; now they can grow crops for the use of people in Europe and buy other things from them in exchange. In another way, too, the trade has changed. In former times, before the use of steam was discovered, only small wooden ships were built which could float in shallow water. Therefore, in those days, they could enter many small and shallow harbours in India. But in modern times the sea-trade of India and Burma is carried on in large iron steamships which can only float in deep water. Accordingly, nowadays, almost all this foreign trade is carried on from the few ports such as Calcutta, Bombay, Karachi, Madras, and Rangoon, which, as we have seen, can take in large steamers; the smaller harbours are used as feeder ports for these large ones.

Since 1850 the foreign trade of India has increased 1000 per cent.

1.—INTERNAL TRADE.

By far the most important trade of every country is that which is carried on within its own limits—that is, between its different provinces. The trade that is carried on in India and Burma by roads, railways, rivers and canals is much greater than that carried on between them and other countries over sea.

2.—FOREIGN TRADE.

Over-sea.—India being an agricultural country with few mineral resources, her exports are chiefly the produce of her fields and forests. Therefore the exports, unlike those of a manufacturing country, vary in amount from year to year according to the favourableness or otherwise of the previous season. Her only important exports of manufactured articles are cotton and jute goods. In return for these India imports manufactured goods which she does not make herself, and metals which are not found in India.

EXPORTS.

(1.) PRODUCE.

1. **Rice.** [illegible] ., Great Britain an[illegible], where it is largely [illegible] (2.) rice-eating cou[illegible] Straits Settlements, Mauritius, and Natal Rice follows the Indian and Chinese coolie all over the world. Burma sends most of it.

2. **Wheat.**—Indian wheat is exported chiefly to Great Britain. The amount sent varies very much. If there is a good harvest in India, and the price in Great Britain is high, it is largely exported, chiefly from the Punjab and the United Provinces, through Karachi and Bombay.

3. **Oil-seeds** (chiefly linseed, rape seed, gingelly, castor, cotton, and ground-nut) are sent to France, Great Britain, Germany, and Belgium. Marseilles (in the south of France) is the largest centre of the vegetable oil industry on the Continent of Europe. Ground-nuts are largely exported from Pondicherry, the French port on the Coromandel coast.

4. **Raw Cotton.**—India is exporting more and more raw cotton every year. Her chief customers are Japan (where cotton mills have largely increased) and the continent of Europe, where goods are made out of the inferior Indian cotton.

5. **Raw Jute.**—Bengal uses one-half of the jute crop in its mills, and sends the other abroad to Great Britain, the Continent, and the United States.

6. **Opium.**—Most of India's export of opium goes to China and the Straits Settlements, where it is smoked by the C[illegible]

estroy cargoes of grain as they did when the ships went the ›ng voyage round the Cape of Good Hope. The Suez Canal ›as also, as it were, turned India's face westwards. In former imes, to a ship doubling the Cape of Good Hope, Calcutta vas almost as near as Bombay; but, in modern days, a steamer coming from Europe by the Canal can reach Bombay or Karachi some days before she can get to Madras or Calcutta round the south of Ceylon.

The building of large iron steamers also helped to shorten the voyage and cheapen the cost of carriage. In this way the trade of India has changed. Long ago India could send to Europe only precious things, in small bulk, such as spices, or ivory, or silk; now, when the cost is much less, she can send all kinds of crops and so her trade has grown enormously. Again, long ago the people of India grew crops for their own use only; now they can grow crops for the use of people in Europe and buy other things from them in exchange. In another way, too, the trade has changed. In former times, before the use of steam was discovered, only small wooden ships were built which could float in shallow water. Therefore, in those days, they could enter many small and shallow harbours in India. But in modern times the sea-trade of India and Burma is carried on in large iron steamships which can only float in deep water. Accordingly, nowadays, almost all this foreign trade is carried on from the few ports such as Calcutta, Bombay, Karachi, Madras, and Rangoon, which, as we have seen, can take in large steamers; the smaller harbours are used as feeder ports for these large ones.

Since 1850 the foreign trade of India has increased 1000 per cent.

1.—INTERNAL TRADE.

By far the most important trade of every country is that which is carried on within its own limits—that is, between its different provinces. The trade that is carried on in India and Burma by roads, railways, rivers and canals is much greater than that carried on between them and other countries over sea.

2.—FOREIGN TRADE.

Over-sea.—India being an agricultural country with few mineral resources, her exports are chiefly the produce of her fields and forests. Therefore the exports, unlike those of a manufacturing country, vary in amount from year to year according to the favourableness or otherwise of the previous season. Her *only important exports of manufactured articles* are cotton and jute goods. *In return for these India imports* manufactured goods which she does not make herself, and metals which are not found in India.

EXPORTS.

(1.) PRODUCE.

1. **Rice.**—There are two markets for Indian rice—(1., Great Britain and European countries, especially Germany, where it is largely used for making starch and for distilling ; (2.) rice-eating countries such as Japan, East Africa, the Straits Settlements, Mauritius, and Natal. Rice follows the Indian and Chinese coolie all over the world. Burma sends most of it.

2. **Wheat.**—Indian wheat is exported chiefly to Great Britain. *The amount sent varies very much. If there is a good harvest in India, and the price in Great Britain is high, it is largely exported, chiefly from the Punjab and the United Provinces, through Karachi and Bombay.*

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4. **Raw Cotton.**—India is exporting more and more raw cotton every year. Her chief customers are Japan (where cotton mills have largely increased) and the continent of Europe, where goods are made out of the inferior Indian cotton.

5. **Raw Jute.**—Bengal uses one-half of the jute crop in its mills, and sends the other abroad to Great Britain, the Continent, and the United States.

6. **Opium.**—*Most of India's export of opium goes to China and the Straits Settlements, where it is smoked by the Chinese.*

7. **Tea.**—Great Britain takes nearly 90 per cent. of all the tea exported from India; some also goes to Canada and Australia. The people of France, Germany, Italy, and the countries of Western Europe do not drink tea, but coffee. The Russians are great tea-drinkers, but they get most of their tea from China. It would make a great difference to the Indian tea trade if the people of America and Europe liked tea as much as do the inhabitants of Great Britain and her colonies. Calcutta exports by far the largest quantity, but now Chittagong with its railway to the Assam valley is becoming a rival.

8. **Indigo.**—Indian indigo is exported to Great Britain, the Continent of Europe, Japan, and the United States, but the trade is growing smaller every year owing to the invention of chemically manufactured indigo.

9. **Raw Hides and Skins.**—Large quantities go to Germany, Italy, Austria, France, and the United States.

10. **Raw wool.**—Great Britain takes nearly all of the exports of raw wool for her woollen manufactories.

11. **Coffee.**—Most of the shipments of Indian coffee go to Great Britain and France. The French are great coffee-drinkers. India supplies only a small part of the world's coffee; most of it comes from Brazil.

12. **Coir and Coir-mats.**—These are shipped chiefly from the coasts of Madras where the cocoa-nut palm flourishes best—for example, from Alleppey, Quilon, and Calicut.

(2.) MANUFACTURED GOODS.

India exports, in large quantities, only two kinds of manufactured goods—namely, *jute* and *cotton*.

Jute.—*Gunny bags and jute cloth.*—The mills of Bengal supply the whole world with gunny bags and jute cloth. The bags are used to carry grain and other commodities, and the great producing countries, such as Australia (grain and wool), the United States (grain), Chili (nitrate of soda), the Argentine Republic (grain and wool), take enormous quantities. The export trade in jute goods is one of the most flourishing in India.

Cotton.—Large quantities of manufactured cotton-twist and yarn and piece goods are exported from India (chiefly from Bombay mills). India now supplies a great part of Asia and Africa with cheap cotton cloth.

Twist and yarn.—Most of this goes to China and the Straits.

Piece goods.—These are sent down the African coast to Abyssinia, the ports on the Red Sea and Persian Gulf, British, German, and Portuguese East Africa, and to the Far East, to the Straits and the Philippines, also to Ceylon.

Other manufactured goods are **silks, lac, woollen carpets and rugs, and cigars, to Great Britain; dressed or tanned skins and hides, to Great Britain and the United States.**

(3) MINERALS.

Gold, chiefly from the Kolar mines in Mysore.

Manganese ore is the only metal, except gold, exported, and it goes to Great Britain, the United States, and Europe.

. now it

IMPORTS.

1. **Cotton.**—(1) Yarn for weaving in India; (2.) piece goods (grey, white, and coloured), shirtings, mulls, drills, handkerchiefs, etc. These come almost entirely from the cotton mills of Lancashire in England. *Cotton goods are by far the largest item of imports into India.*

2. **Metals** (especially iron and steel), imported into India usually in a

bolts, screws

almost entire

are sending m

imported annually large quantities of the precious metals, especially silver. All the silver used in India has come from abroad at some time or other.

3. **Machinery, including railway materials and mill-work,** almost entirely from Great Britain, which is the great country for iron manufactures. Germany and the United States also send a small proportion. The imports of machinery

this is one of the best

the Indian Empire.

from Great Britain (Sheffield); some from Belgium and Germany.

5. **Sugar.**—Cane sugar from Mauritius and Java; beet sugar from Germany and Austria.

6. **Mineral oil,** from Russia and the United States—countries with large oil-fields. But Burma is yearly supplying more and more.

7. **Silk.**—Raw silk from China and the Straits Settlements; silk goods chiefly from Japan, but also from China, France, and Great Britain.

8. **Woollen goods,** mostly from Great Britain and Germany.

9. **Provisions,** mostly for the use of the Europeans in India, and therefore chiefly from Great Britain; but large quantities of salt fish (from the Straits Settlements), and dates from Persia, Turkey, and Arabia, are imported for the use of the natives of India.

10. **Liquors.**—The taking of intoxicating drink is against the caste of most Hindus, and is forbidden by the Koran, so that these liquors are chiefly consumed by Europeans. The malt liquors come from Great Britain, and the wines from the grape-growing countries of France, Germany, and Spain.

11. **Clothes and boots and shoes**—from Great Britain and (a little) from the continental countries of Europe—mostly worn by Europeans.

SOME SPECIAL IMPORTS.

Horses from Australia and Arabia; **matches** from Japan, Sweden, and Norway; **enamelled iron work and glass** from Austria; **clocks and watches** from France and Switzerland; **camphor** from Japan; **betel-nuts** from Ceylon. In the year 1905–6 over half a crore's worth of motor cars and cycles was imported. This figure is now largely exceeded annually.

The great mass of the people of India are poor, and cannot afford to buy many foreign goods. **Cotton cloth, kerosene oil,** and **matches** are almost the only foreign goods found in every household.

3.—TRANS-FRONTIER TRADE.

There is as yet but little trade between India and Burma and the neighbouring countries. There are few good roads outside of India, and these few are often dangerous. Most

of the trans-frontier trade is carried on with Afghanistan, Nepal, Tibet, and Western China. India and Burma export *cotton goods, metals, salt, sugar, tobacco,* and *indigo,* and import *cattle, horses, fruits, wool, drugs, seeds,* and *timber.*

4.—COASTING TRADE.

There is a large trade carried on by native craft and small steamers along the coasts of India and Burma These vessels collect goods from the smaller ports and take them to the large harbours, such as Rangoon, Calcutta, Madras, Colombo (in Ceylon), Bombay, and Karachi, where they are transferred to large ocean-going steamers for export The Madras coasts have many small ports, and hence there is a large coasting trade there. Calcutta is the centre of the coasting trade on the northern shores of the Bay of Bengal Bombay is the centre of the trade of the Konkan and the Gulf of Cambay, and Rangoon of the Arakan and Tenasserim coasts. Bombay ships cotton goods up and down the western sea-board. Calcutta sends coal to Madras, Rangoon and Ceylon to feed the steamers in these harbours, and gunny bags to Burma. Rangoon sends oil and rice to Calcutta, Madras and Bombay,

5.—TRANSIT TRADE.

India juts out, as a great peninsula, into the Indian Ocean and lies half-way between the two great gate-ways of commerce, the Suez Canal and the Straits of Malacca. We might expect, therefore, that India should be a kind of half-way house for trade between the East and the West. But this is not so, for, as we have seen, India has but few harbours able to take in the large steamers which nowadays carry the world's trade, and none of these harbours is situated near the end of the peninsula round which ships must pass.

It would make a great difference to India if she had a large harbour in the south where big vessels and mail-steamers could touch on their way to and from other countries. Colombo, in Ceylon, is a port of this kind. It is the meeting-place of many ocean-routes, and steamers from *all* parts visit its harbour to coal. It has been proposed to connect India with Ceylon by a railway across Adam's Bridge. If this is ever done, it might make Colombo a port for Indian trade.

AREA AND POPULATION OF THE INDIAN EMPIRE.

In 1911 the population of the whole of India, including Burma, was over 30 crores—namely, 31,51,32,527. This is a larger population than that of any other country in the world except China.

	Area in Square Miles.	Population, 1911.	Population, 1901.
INDIA—Grand Total..	1,766,579	315,132,537	294,361,056
PROVINCES............	1,097,901	244,267,542	231,605,940
1. Ajmer-Merwara...	2,711	501,395	476,912
2. Andamans and Nicobars.........	3,143	26,459	24,649
3. Assam..............	53,226	6,713,635	5,841,878
4. Baluchistan........	45,804	414,412	382,106
5. Bengal.............	78,416	45,483,075	42,141,477
6. Bihar and Orissa.	83,204	34,490,084	33,242,783
7. Bombay............	123,064	19,672,642	18,559,650
8. Burma..............	236,738	12,115,217	10,490,624
9. Central Provinces and Berar........	100,345	13,916,308	11,971,452
10. Coorg	1,582	174,976	180,607
11. Madras............	141,726	41,405,404	38,229,654
12. North-West Frontier Province....	16,466	2,196,933	2,041,534
13. Punjab.............	97,209	19,974,956	20,330,337
14. United Provinces of Agra and Oudh............	107,164	47,182,044	47,692,277

	Area in Square Miles.	Population, 1911.	Population,* 1901
STATES AND AGENCIES	691,253	70,864,995	62,755,106
1. Assam (Manipur).	8,456	346,222	284,465
2. Baluchistan States	86,511	396,432	428,640
3 Baroda State.	8,099	2,032,798	1,952,692
4 Bengal States	5,393	822,567	1,024,764
5 Bihar and Orissa States ..	29,955	4,538,161	3,881,448
6. Bombay States.	65,761	7,411,675	6,908,559
7. Central India Agency .	78,772	9,356,980	8,497,805
8 Central Provinces States. . . .	31,188	2,117,002	1,631,140
9. Hyderabad State.	82,698	13,374,676	11,141,142
10. Kashmir State .	80,900	3,158,126	2,905,578
11. Madras States. .	9,969	4,811,841	4,188,086
12. Mysore State.	29,444	5,806,193	5,539,399
13. North-West Frontier Province (Agencies and Tribal Areas)	—	1,622,094	83,962
14. Punjab States	36,532	4,212,794	4,424,398
15. Rajputana Agency	127,541	10,530,432	9,853,366
16. Sikkim..	2,818	87,920	59,014
17. United Provinces States..	5,079	832,036	802,097

Population of the chief cities of the Indian Empire with over a lakh of inhabitants.

Calcutta (including Howrah) ....over 12 lakhs | Bombay .. .. over 9 lakhs | Madras ... .. over 5 lakhs
Hyderabad (Deccan) ....over 5 lakhs

Over 2 lakhs:—

Rangoon	Delhi	Benares
Lucknow	Lahore	Ahmadabad

Over 1 lakh:—

Bangalore	Poona	Patna	Bareilly	Dacca
Agra	Amritsar	Mandalay	Trichinopoly	Nagpur
Cawnpore	Karachi	Madura	Meerut	Jubbulpore
Allahabad	Jaipur	Srinagar	Surat	

CEYLON.

Position, Size, and Shape.—Ceylon is an island lying to the south-east of the peninsula of India. Its position on the map may be easily fixed by noticing that a line drawn due south from Point Calimere just touches the west coast of the island, and another line drawn due east from Cape Comorin cuts off about a third of its length. In size it is a little smaller than Mysore State, and in shape it is not unlike a mango. [*See maps* 54, 55, 56, *and* 57.]

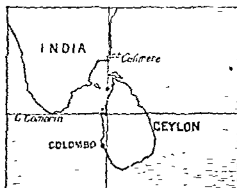
Relief.—A good idea of the relief or build of Ceylon is obtained by remembering that it consists of **a central core of mountains, surrounded by lower hills and table-lands which slope gradually down to the sea in all directions.** This central core, however, is not exactly in the middle. If we draw a line from the most northern to the most southern point of Ceylon and then draw another at right angles to this, across the broadest part of the island, the point where these lines cut one another gives us the position of the core of mountains. The highest summit is **Mount Pedro** or Pidurutallagalla, 8296 feet. Round this centre the map shows us there are many other high mountains, *e.g.* **Adam's Peak,*** 7353 feet. The high country shelves away from this mountainous core on all sides, most steeply on the south and west, and more gradually on the east and north. The whole of the rest of the island consists of a plain, nearly flat, sloping gradually to the sea: in the north this plain ends in the long flat **peninsula of Jaffna.** As the mountainous core is well south of the centre of the island the long slope will be northward and the short slope southward, and therefore the north-flowing rivers will be longer than those flowing south.

Another way to get a general idea of Ceylon is to imagine that a mass of the Western Ghats has been separated from the

* Adam's Peak, though not the highest peak, is the best known, because it is the most easily seen from all sides, and also because its summit is the centre of Mohammedan and Buddhist pilgrimages.

mainland, and that it has for ages and ages been worn down by rain and rivers till an immense plain (made up of the gravel, sand, and soil they have washed down) has been formed all round If a person were to travel westwards from Pondicherry across the broad coast plain, over the Nilgiri Hills, and down to the Arabian sea-coast he would traverse *a country very similar to that which a traveller* would meet with in making a journey from the north of Ceylon to the south. **In many ways Ceylon is a "pocket-edition" of Southern India.**

Coasts and Islands.—The map shows that Ceylon, like India, has **a very unbroken coast-line** with but few important



54 POSITION OF CEYLON.

inlets. **Trincomali**, in the north-east, with a magnificent natural harbour, is much the most important. **Galle Harbour** in the extreme south is much smaller and very rocky. The whole of the coast is flat and sandy with lagoons or **backwaters** nearly everywhere. These are very like the backwaters of Malabar, but they are much more extensive. Right down the west coast there is a line of such backwaters joined together by a canal dug by the Dutch. In the same way backwaters run along nearly all the south and east coasts. At Batticaloa on the east coast there is an inland water-way 30 miles long. In the extreme north the peninsula of Jaffna is divided up by two large shallow lagoons, one of which really separates it from the mainland. These lagoons are filled with brackish water as they are connected at certain points with the sea; at other points they are entered by

rivers the mouths of which are blocked by sand-banks thrown up by the sea in the monsoons. The island is, as we saw, separated from India by the shallow **Palk's Strait.**

Thus Ceylon, like India, suffers from the want of large and deep inlets where harbours can be built to take in large vessels. The rivers all enter the sea by shallow sand-blocked mouths which make them quite useless for big steamers. Trincomali and Galle harbours are, as was mentioned, the only natural ones; a good artificial one has, as we shall see, been built at Colombo.

Manaar, lying at the Ceylon end of Adam's Bridge, and a few flat unimportant islands off the Jaffna Peninsula, are the only islands worth mentioning. **The Maldives**, a low-lying coral group lie far to the west. In soil and productions they resemble the Laccadives already described (*see* p. 30). Though not geographically connected with Ceylon they are joined to it for purposes of government.

Climate and Rainfall.—From what has been said of the climate of India it is not difficult to understand that of Ceylon.

Latitude.—As it is nearer the equator than India the heat is on the whole greater, and there is less difference between the hot and the cool season, the sun being, at mid-day, always either directly overhead or nearly so.

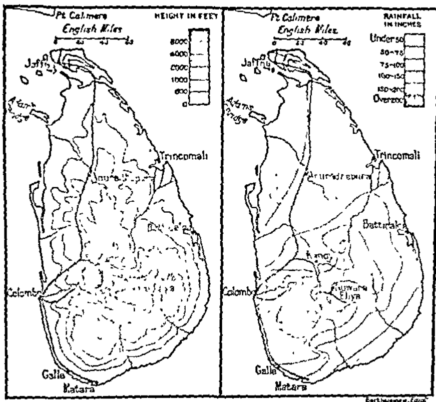
Altitude.—The central mountainous parts are of course the coolest. At Nuwara Eliya, on Mount Pedro, water sometimes freezes overnight. In the plains it is never really cool.

Nearness to Sea.—Ceylon being a flattish island, the influence of the sea as an equaliser of temperature is very marked. In the hottest season the breezes from the sea keep it much cooler than places in India, such as Multan or Lahore, which, though much farther north, are far inland.

Mountain Ranges and Prevailing Winds.—The island is right in the track of both monsoons and thus its mountains catch the moisture-laden clouds from the south-west from May to September, and those from the north-east from October to March. During the summer monsoon, therefore, the south-western slopes of the mountain mass, and the plains between them and the sea, receive a large rainfall in the same way as do the Western Ghats and the west coast-strip of India. The low-lying heated northern and southern parts receive but little rain, just as we saw the low lands of

Sind are scarcely touched during the same season, and the leeward slopes of the mountains will, like the Deccan, only receive a scanty fall.

Again, during the winter monsoon, the slopes of the mountain mass facing north-east receive a deluge, its south-west slopes being now on the lee or sheltered side. It is to



55. CONTOUR MAP OF CEYLON. 56. RAINFALL MAP OF CEYLON.

be noticed, however, that during this season almost the whole of the island receives good rain. Even on the leeward side of the island there is a good rainfall because, the temperature *during this part of the year being at its lowest, the* moisture of the monsoon is then most easily condensed. On the whole, then, the central and south-western parts of Ceylon may be said to have a hot and damp climate; since it is an island and in the path of the monsoon every part

receives some rain. Only in the north-west and south-east corners is the rainfall below 50 inches. All the rest of the island receives over 50, the amount increasing as we near the central mountains, which receive 150, and, in some places, more than 200 inches.

It is fortunate for Ceylon that these mountains which form her reservoir of water are fairly near the centre and not on a coast like the Western Ghats. By their position they are able to distribute their heavy rainfall in all directions by means of rivers. On the other hand, we must remember that the sun being, all the year round, nearly straight overhead at mid-day the evaporation is very great.

The Nature of the Soil.—The soil of Ceylon is, on the whole, not fertile, except where water from the mountains can be stored up in tanks. On the low flat coast-strips the land is made up of brackish sand on which nothing but cocoanuts will grow. The Government of Ceylon "reserves" all lands over 5000 feet above sea-level for forests. It was found here, as in India, that if forests were cut down or burned the rain escaped to the brooks and rivers very quickly instead of soaking slowly through the undergrowth.

Rivers.—The build of Ceylon and its rainfall explain its rivers at a glance. They flow seaward in all directions from the central mountain mass. Those on the south and west, as they have a steeper slope, and a less distance to go, are more rapid and shorter than those on the east and north. The rivers flowing northwards, eastwards, and southwards nearly dry up by evaporation during the south-west monsoon, which is their dry season. Those running south-west receive rain in both monsoons, and therefore flow all the year round.

The **Mahaweli Ganga** ("great sandy river") rises in the centre of the mountain mass, and drains it by many tributaries; its general course is nearly due north and it enters the sea on the east coast. In the mountains it flows very rapidly in torrents and waterfalls; in the plains it is a sluggish stream, and it breaks into many channels before it enters the lagoon on the coast. Being fed by both monsoons it carries a large amount of water to the sea, but it can only be used for boats and canoes here and there. Another river, the **Kelani Ganga**, flows almost due westwards from the mountains round Adam's Peak to the sea. As it receives

rain in both monsoons it never dries up, but there is only a little boat navigation.

The heavy rainfall of Ceylon gives birth to many smaller rivers, but none of them is of any use for navigation.

Natural Productions.—The climate and rainfall of Ceylon tell us that it is a completely **tropical island** with a high and very even temperature throughout the year, and with no cold season. The south-west quarter, including the mountain mass, receives rain almost throughout the year from both monsoons, and is *therefore much the most fertile.* The rest of Ceylon is a flat dry plain with a short wet season in the winter months, and a rainfall of less than 70 inches —in some places less than 30 inches. The dry region is largely covered with forests, though formerly it was paddy land: the wet region has been almost stripped of its forests and is well cultivated.

Round the sea-coasts there are great **groves of cocoanut palms**, which thrive best on the salt, sandy soil. Farther inland we find wide stretches of **paddy cultivation** wherever water can be obtained from rivers or tanks, and in terraces *among the hills.* The higher hills are almost covered with **plantations of tea,*** a shrub which thrives best in high easily-drained and well-watered land under a tropical sun. Many other tropical plants are also grown. there are several **varieties of palms**; in the forests are fine hard **timber trees** such as satin wood, ebony, and many others; various kinds of **spices** flourish, such as cardamoms, nutmegs, cloves, cinnamon, and pepper. In the lower wet lands the **rubber tree** has been largely planted. On the whole the vegetation of Ceylon is almost the same as that of Southern India: the plants of the mountain mass correspond to those of the Nilgiri Hills.

Animals.—The animal life of Ceylon is akin to that of South India, but some species correspond closely to those found in Malaysia. Ceylon was at one time covered with forests in which wild animals swarmed. Now much of the forest has been cleared, and there is a danger that some species will become extinct. The Government has therefore reserved

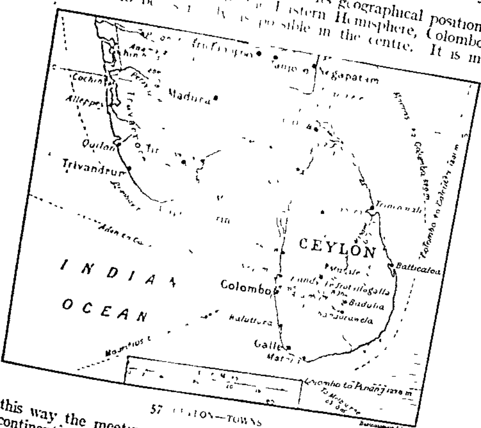
* About 1880 a leaf disease attacked the coffee shrubs, which at that time were cultivated all over the uplands of Ceylon, and soon the whole industry was destroyed and the estates abandoned. Tea has now taken the place of coffee as the staple crop for export, and prosperity has returned.

large tracts of forest land as asylums or "Sanctuaries," in which no animal can be shot or trapped. Of flesh-eating wild animals, the largest is the **cheetah** or **leopard**; of non-flesh-eaters, the **elephant** is found in herds, and **wild buffaloes, deer,** and **wild pigs** are common. Ceylon is famous for many kinds of **monkeys**. The domestic animals are the same as those of India. Most of the birds correspond to those of Southern India: the numerous lagoons attract flocks of water-birds. Ceylon has many kinds of **reptiles** peculiar to itself.

Distribution of Population.—More than three-quarters of Ceylon is uncultivated, and so the population is less dense than that of most parts of India. The most thickly peopled part is, of course, the south-west corner which receives most rain and is therefore the most fertile. As in India, about two-thirds of the people are engaged in agriculture, *i.e.* tilling the soil, working in the forests, and grazing cattle and goats. The uplands had formerly but few inhabitants till European settlers began planting and by good wages attracted to their coffee and tea-estates thousands of Tamil coolies from India. Most of the hill villages and towns are inhabited by these Tamils, and by small merchants who supply their wants. As Ceylon is a purely agricultural country the population is gathered into small villages and there are very few towns, and only one city of over a lakh of inhabitants. As in India and Burma towns grew up around the **forts of native chiefs and kings. Sacred places** attracted pilgrims, priests, and merchants, and, in modern times, Government has chosen certain towns as the **capitals of districts** where offices have been built and courts are held. Trade with other countries centred round **places on the coast** where ships and steamers could lie close to the shore in safety, and to which goods could easily be sent from up-country.

Towns.—Much the largest town is **Colombo** (186) on the west coast. Even before the harbour was built the Portuguese and the Dutch had a fort here just as the English had at Madras, to protect their factories and inland trade. Colombo being situated close to the centre of the island and near its most fertile parts soon became the focus of a large trade both inland by roads and along the flat coast by canals and backwaters. In modern times a splendid harbour has been built by means of great stone breakwaters,

and this has increased the size and prosperity of the tow
so that now Colombo has almost a monopoly of the foreig
trade of Ceylon. It is also the terminus of the railway
running up-coun[illegible] along the coast.
But the port also [illegible] much to its geographical position
If we look at [illegible] Eastern Hemisphere, Colombo
is seen to be [illegible] possible in the centre. It is m



57 CEYLON—TOWNS

this way the meeting-place of the ocean highways of four continents, Europe, Asia, Africa, and Australasia, and may be called the half-way house between East and West. All steamers require coal, and Colombo, situated in the centre of a great ocean, is one of the chief coaling-places in the world. The coal is brought from England in vessels built for the purpose. Thus in its harbour vessels from all parts the world meet, and if we reckon by the number and size the vessels entering it in a year, Colombo is one of the chief

large tracts of forest land as asylums or "Sanctuaries," in which no animal can be shot or trapped. Of flesh-eating wild animals, the largest is the **cheetah** or leopard; of non-flesh-eaters, the **elephant** is found in herds, and **wild buffaloes, deer, and wild pigs** are common. Ceylon is famous for many kinds of **monkeys**. The domestic animals are the same as those of India. Most of the birds correspond to those of Southern India: the numerous lagoons attract flocks of water-birds. Ceylon has many kinds of **reptiles** peculiar to itself.

Distribution of Population.—More than three-quarters of Ceylon is uncultivated, and so the population is less dense than that of most parts of India. The most thickly peopled part is, of course, the south-west corner which receives most rain and is therefore the most fertile. As in India, about *two-thirds of the people are engaged in agriculture, i.e. tilling* the soil, working in the forests, and grazing cattle and goats. The uplands had formerly but few inhabitants till European settlers began planting and by good wages attracted to their coffee and tea-estates thousands of Tamil coolies from India. Most of the hill villages and towns are inhabited by these Tamils, and by small merchants who supply their wants. As Ceylon is a purely agricultural country the population is gathered into small villages and there are very few towns, and only one city of over a lakh of inhabitants. As in India and Burma towns grew up around the **forts of native chiefs and kings. Sacred places** attracted pilgrims, priests, and merchants, and, in modern times, Government has chosen certain towns as the **capitals of districts** where offices have been built and courts are held. Trade with other countries centred round **places on the coast** where ships and steamers could lie close to the shore in safety, and to which goods could easily be sent from up-country.

Towns.—Much the largest town is **Colombo** (186) on the west coast. Even before the harbour was built the Portuguese and the Dutch had a fort here just as the English had at Madras, to protect their factories and inland trade. Colombo being situated close to the centre of the island and near its most fertile parts soon became the focus of a large trade both inland by roads and along the flat coast by canals and backwaters. In modern times a splendid harbour has been built by means of great stone breakwaters,

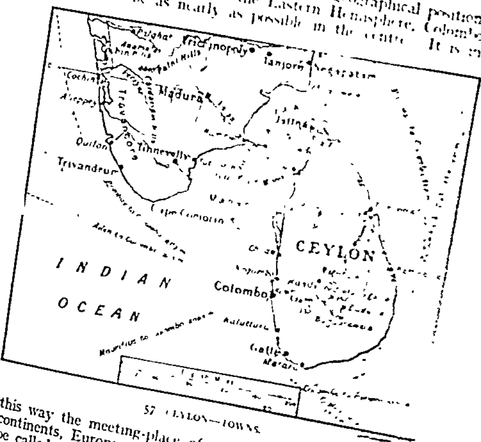
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But the port also owes much to its geographical position.
If we look at a map of the Eastern Hemisphere, Colombo
is seen to be as nearly as possible in the centre. It is in



57 CEYLON—TOWNS.

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Other Towns.—The other towns in Ceylon are all small and are either (1) **Coast-towns** (often with old Dutch forts) engaged in fishing and trading in cocoanuts, coir, and copra, along the canals and backwaters close to the seashore, or (2) **up-country towns and villages** in which the cultivators live.

Coast-towns.—**Jaffna** in the extreme north on a flat peninsula has a shallow harbour suitable for small ships. It was the gateway by which the hard-working Tamils of South India entered Ceylon and is a centre of Tamil population. **Chilaw, Negombo, Kallutturai, Galle,** and **Matara** (far south) are all typical fishing and cocoanut towns, most of them on the fertile west coast and joined by backwaters and by a coast canal made by the Dutch. The last four are also connected with Colombo by the coast railway. Galle is the most important of these: it has the only good natural harbour in the south and west coasts, and before the harbour of Colombo was built it was the port of call for all steamers. Since then its trade has diminished. **Trincomali** has a fine natural harbour, but as it lies away from the chief centres of production and as it is off the track of steamers, it has little value for trade. It was formerly a naval station, but has now been abandoned for that purpose.

Up-country towns.—**Kandy,** near the centre of the mountain mass, was the capital of the former Kandyan kings. It is now a centre of pilgrimage for Buddhists visiting the Temple of the Sacred Tooth which is situated on the shores of a beautiful lake. It is also the centre of a large tea-planting district. Near it are the famous **Paradeniya Gardens,** full of the most beautiful trees and plants. Farther up the railway, at the foot of Mount Pedro, is **Nuwara Eliya,** the finest hill-station in Ceylon.

Old Capitals.—Ceylon is famous for ruined and buried cities. The Sinhalese in ancient times had many large towns built round forts and shrines but these were almost all destroyed by the Tamil invaders. One of these, **Anuradhapura,** in the north centre of the island, is one of the wonders of Ceylon. It consists of ruined Buddhist pagodas, monasteries, and bathing tanks which mark the site of a once large and flourishing city now deserted. Here too is a sacred Pipal

or Bo tree, said to have been brought from [illegible] and planted over 2150 years ago.

Peoples, Religions, and Languages [illegible] Sinhalese [illegible] by far the largest part [illegible] have come as conquerors [illegible] ago. They speak [illegible] Buddhists, having [illegible] from Maghada in northern [illegible] death of Gautama Buddha [illegible] Tamils [illegible] Southern India [illegible] taught the Sinhalese how to [illegible] in India, afterwards [illegible] conquerors who pillaged and [illegible] the island. At the present day [illegible] Tamil coolies from Madras [illegible] work on the tea-estates [illegible] course, Dravidian in blood [illegible] **Moormen.**—In early times Ceylon [illegible] traders and their descendants [illegible] Mohammedans and have intermarried with the Tamils whose language they now speak. The **Malays**, in the same way, are descendants of the soldiers formerly employed by the Dutch and English from the Malay States—Mohammedans in religion.

There are also many **descendants** of the **Portuguese** and **Dutch** who came in early times as traders and conquerors. Most of them intermarried with the Sinhalese and their descendants are called Burghers; they are all Christians and mostly speak English.

There are a few **Europeans**, chiefly British, engaged as planters, engineers, or Government servants.

Besides these civilised peoples there are a few **Veddas** who live chiefly by hunting in the up-country jungles. They are supposed to be the aborigines of the country and, like the tribes of aborigines in India and Burma, are quite uncivilised and nature worshippers or animists in religion. Their language is now much mixed with Tamil and Sinhalese words owing to intermarriages.

Mineral Resources.—Ceylon is not rich in the most useful minerals. There is plenty of **iron** but, owing to want of fuel to smelt the ore, it cannot be worked so cheaply as in Europe and therefore it is not mined. **Plumbago**, a mineral

used in making lead-pencils and crucibles is the most important of Ceylon's minerals and is obtained in large quantities. **Gems.**—Ceylon is noted for many kinds of precious stones, such as rubies, cat's-eyes, sapphires, and garnets. They are obtained by washing the mud, gravel, and sand brought down by rivers from the rocks of the hills. **Mica, gold, and thorianite** are found in small quantities. The flat coasts and long backwaters are suitable for the manufacture of **salt.** In the calm water in the Gulf of Manaar the oysters from which pearls are obtained are found in abundance.

Industries.—The chief industry of Ceylon as of India and Burma is **agriculture,** and two persons out of every three get their living by tilling the land (especially in paddy fields), by grazing cattle, by growing cocoanuts and other palms, and by working on tea-estates, and in forests. The rest make their living by **fishing,** by **preparing the products of the cocoanut palms,** such as coir, copra, and oil, and by finding and polishing gems, &c.

Communications.—There are many roads all over the island chiefly connecting important centres such as Kandy and Colombo with out-lying districts. The Dutch dug many canals along the flat coasts, and these have been largely helped by natural backwaters. Ceylon is not a rich and fertile enough country to have many railways. The main lines connect Colombo with the tea-growing mountainous districts and the fertile south-west coast. Another line now runs to Jaffna up the middle of the island. The rivers are not large enough for navigation: their mouths are blocked by sandbanks, and in the dry season they almost all dry up.

Trade.—Ceylon being an agricultural country, its internal trade consists in exchanging the products of one part of the country for those of another. The external trade, for the same reason, resembles that of India and Burma; that is, the products of the soil are exchanged for the manufactured goods of other countries. Unluckily, however, Ceylon does not grow many things which foreign countries want. Her foreign trade depends very largely on two plants, the **tea shrub** and the **cocoanut palm,** the one growing on the mountains and the other along the flat sandy shore. Tea makes up nearly half of the exports and goes to Great Britain and her Colonies. Next come **cocoanut products,** such as coir, copra, and oil. **Spices,** such as cinnamon, cardamoms,

pepper, and cinchona, with a little **cocoa** and **plumbago** fill up the list. It is expected that in a few years, when the recently planted trees are fully grown, large quantities of **rubber** will also be exported.

Imports.—It is curious that an agricultural country like Ceylon does not grow enough food for itself. Much of the soil is naturally poor and it pays better to grow tea, cocoa, and rubber, and buy food from abroad than to cultivate food-crops, such as paddy. In this way **more than half** of the imports of Ceylon consist of **food-grains**—chiefly **paddy** from India and Burma. **Coal** from England for passing ships and for machines and railways is also largely imported; so is **kerosene oil**. Like India and Burma, Ceylon imports large quantities of **cotton-cloth**, **metals**, and **machinery**—most of them from Great Britain.

History and Government.—The Sinhalese who had their own kings from 543 to 1815 reached a high degree of civilisation many centuries ago, as can be seen by the ruins of their ancient cities. This civilisation was, however, rudely interfered with by Tamil invaders who over-ran their fields and destroyed their cities, monasteries, temples, and tanks.

In 1506 the Portuguese made their appearance in Ceylon and took possession of parts of the coast which they held for 150 years. In 1656 the Portuguese were driven out by the Dutch who built forts, canals, and waterways, cultivated cocoanuts, spices, and coffee, and did much to develop the trade of the island. At the Peace of Amiens in 1802 Ceylon became a British possession in exchange for Java given to the Dutch. All this time, however, the interior of the island was ruled by a descendant of the Kandyan kings, and it was not till 1815 that the whole island came under British rule. Since then Ceylon has enjoyed peace and prosperity.

Ceylon is ruled by a Governor in the name of the King of Great Britain: he is appointed for five years, and is assisted by an Executive Council and a Legislative Council of twenty members. For the purposes of government the country is divided into nine provinces.

AREA AND POPULATION OF CEYLON.

Area in Sq Miles.	Population in 1901	Inhabitants per Sq Mile.
25,332	4,095,325	161

INDEX.

Place-names are in Italics; **productions and commodities** (natural [or]
otherwise) in **thick type**; other matters in Roman (ordinary) type. Figu[res]
in thick type (**124**) refer to more important notices of the subject. Entri[es]
of two or more words are under the first word—for example, *Khyber Pa[ss]*,
Chota Nagpur, Taj Mahal; but if the first word is generic, the entry is und[er]
the second—for example, *Ganges, River; Cutch, Gulf of.*

Abbreviations used in the index:—

Ag. = agency.
C. = cape.
Chars. = characteristics.
Cl. = climate.
Coms. = communications.
Dist. = district.
Div(s). = division(s).
G. = gulf.
Govt. = government.
Hist. = history.
Hs. = hills.
I. = island.
L. = lake.
Manu. = manufactures.
Mt(s). = mountain(s).
P. = pass.
Phys. = physical.
Pl. = plain.
Pop. = population.
Prods. = products.
R. = river.
Ra. = range.
St. = state.
Str. = strait.
Tn(s). = town(s).
Tr. = trade.
Vall. = valley.

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(1,335)

THE END.

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